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Wastewater
Asset Management Plan

1 July 2021 – 30 June 2031

20 SEPTEMBER 2022

South Waikato District Council

PLAN

Wastewater Asset Management Plan 2021 - 2031

Plan management – review and update records:

Draft	17 December 2021
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Introduction

The purpose of this asset management plan is to describe how wastewater assets in the South Waikato District will be managed so that acceptable levels of service are provided in the most cost-effective manner and contribute to the achievement of the 2021 – 2031 Long Term Plan (LTP).

This plan details information about:

- The strategic outcomes that Council is seeking to achieve related to wastewater infrastructure.
- The level of service to be provided.
- The infrastructure that needs to be maintained, renewed, and developed to meet the demands placed on it over the next 30 years.
- How these services are to be provided.
- What funding is required to meet these demands.
- The associated risks.

The AMP covers the period 1 July 2021 to 30 June 2031 with a particular focus on work programs over the next five years. It informs the Councils 2021/31 10 Year plan and the 30-year infrastructure strategy and contributes to meeting Councils identified strategic outcomes.

What we do

The South Waikato District Council (SWDC) is in the business of owning, operating, and maintaining wastewater collection networks and disposal schemes in Arapuni, Tirau, Putāruru, and Tokoroa communities.

We collect wastewater from homes and businesses via sewage pipes and send it to the treatment plants either by gravity or pumping.

We treat wastewater to a high quality, then discharge it to water or land.

The services that are provided to the community through the assets in this plan are as follows:

- Wastewater collection provided throughout the urban environment including wastewater collection from the towns of Tokoroa, Putāruru, Tirau and Arapuni
- Gravity and pumped delivery of the wastewater to the individual wastewater treatment plants.
- Treatment at the Tokoroa, Putāruru, Tirau and Arapuni Wastewater Plants prior to discharge of the treated effluent to the receiving environments.

The key assets that contribute to providing these services are summarized in the below table. Due to the Tokoroa Digester Replacement project, the number of the pump stations increased by one since the last AMP document compiled in 2018.

Asset Component	Quantity
Pipelines	169 km
Manholes	3209
Pump Stations	18
Treatment Plants	4

The total replacement value of the wastewater assets over period of 2020 to 2080 is **$83.3 M**.

Asset Condition and Performance

The overall performance of the wastewater network is considered to be Good, although there are some Poor and Very Poor condition assets.

Wastewater Collection Network

The overall performance of the wastewater collection network is considered to be Good based on the overall relatively few overflows and pipe blockages that occur.

However, there is significant stormwater inflow and infiltration in older parts of the network contributing to high peak wet weather flows. There are also a number of pipe blockages occurring in service laterals and some smaller diameter sewers due to the impact of root intrusion.

Wastewater Pump Stations

The majority of the pump station assets are in Good to Excellent condition. Two of the larger pump stations Baird Road and Tasman Drive have been identified as requiring minor seismic upgrades during the term of this AMP. Some smaller pump stations are fitted with obsolete electrical and control equipment and are in need to upgrading, which is scheduled early in the next 10-year period.

Wastewater Treatment Plants

The Councils Wastewater Treatment Plants have in general been well maintained to a high standard with an ongoing maintenance program and timely replacement of mechanical and electrical equipment, as necessary. Major upgrades to the inlet screens, grit traps, and pumps/blowers are either in progress or programmed for the next 10-year period. In addition, with the funding made available from the Three Waters Reforms program the Council has been able to bring forward proposed denitrification treatment at the Tokoroa Treatment Plant and achieve greater discharge quality 10 years sooner than previously forecast.

The wastewater discharge consents have either been renewed (in the case of Tirau and Putāruru) or are still to be renewed (Tokoroa and Arapuni) which will require additional upgrades to be made. The Putāruru Wastewater Treatment Plant is the first plant scheduled for upgrades which are due in 2026 and are intended to improve nitrogen removal prior to discharge.

Why we do it

The provision of wastewater collection networks and treatment plants is vital to the needs and aspirations of all who live in the District. They provide the means of safe, reliable, and efficient disposal of wastewater for resident's homes, schools, and businesses 24 hours a day, 365 days a year in a manner that is safe for both human health and the environment.

Our Goals and Outcomes

The Wastewater activity contributes to the Council’s Vision, Outcomes and Strategies linking to the Levels of service and driving performance objectives. Asset management planning is undertaken within both an internal and external strategic environment. The assumptions around which this AMP has been framed are outlined further into this document and include:

- The assets will remain in Council ownership, subject to the future impacts of the Government-led water reform and legislations arising from the Water Services Bill
- Inflation factors have been applied to budgets over the next 30 years based on BERL indices
- Assumed asset lives are reasonable
- Growth in Demand will be in line with current forecasts – potential changes in demand due to growth have been factored into our renewals as new assets programmes.

Council’s strategy presents what we are going to do for the next ten years to make our district a better place to live and work. At the core of our strategy is our vision, our outcomes, and our strategies. The link between the three is explained in the figure below:

The external strategic environment is also of relevance in that the performance of the wastewater network is governed by legislative obligations and dependant on the management of the receiving waters which fall under the control of the Waikato Regional Council.

Three Waters Reforms and Water Services Bill

In addition to the above, the proposed Three Waters Reforms are likely to significantly impact on the delivery of the wastewater services in the District. With the creation of a new water regulator Taumata Arowai, the performance of our wastewater treatment plants will be under additional scrutiny.

There is currently strong policy direction from national and local government to improve the state of our waterbodies as reflected in the Vision and Strategy, the National Policy Statement for Freshwater Management, the National Environmental Standard for Freshwater, the Waikato Regional Policy Statement, and Plan Change 1 of the Waikato Regional Plan.

These policies expect improvements in water quality nationally and their implementation can be expected to require a shift in wastewater and stormwater management. This will require TAs across the region to continue to seek funding through Long Term Planning processes to resource further upgrades. Recently, TAs in the region including the SWDC have taken advantage of funding made available by the Government which has enabled some upgrade programmes to be brought forward.

The Water Services Bill currently before Parliament will significantly impact upon 3-waters management in New Zealand. The new water regulator, Taumata Arowai, will regulate drinking water suppliers and oversee wastewater and stormwater utility providers and regulators (including Regional Council regulatory responsibilities). The Water Services Bill will require additional monitoring and reporting requirements for wastewater, stormwater, and water management.

There is a lot of uncertainty about the impact of the Three Waters reform on water services activity while it remains our responsibility. However, it is likely that additional staff time may be required during this rapid transitional phase to become familiar with the requirements of the new regulator and the handover process.

In the meantime, we will continue to operate the Water Activity prudently as a going concern. We are well-placed to proactively respond to Three Waters Reform because of our early regional collaboration and signing of a Memorandum of Understanding with the Crown. It is likely that by the end of 2021 we will have decided on how we want to participate in the formation of a new water services entity.

Contribution to the Council Strategy

The wastewater activity primarily contributes to the following Council outcomes and strategies:

Outcomes	Strategies
Growth: Council aims to increase population and jobs, reduce unemployment, increase average earnings, and improve the deprivation index.	Infrastructure: It is imperative that our wastewater plant is fit for purpose in terms of a growing population and the associated demand.
Resilience: We all, Council, and community, need to anticipate, resist, respond to and recover from significant change or events.	Environmental resilience: In alignment with the proposed Healthy Rivers Plan changes, Council is obliged to undertake wastewater management that has reduced impact on waterways such as the Waikato River.
Relationships: We will build stronger relationships with Iwi and Māori along with community and business groups to ensure that by working together we can achieve growth and a resilient community.	Engagement: Council and Raukawa have undergone a significant engagement process regarding options for the new wastewater plant.

AMP Response to the Strategic Context

The approach taken in this AMP is to ensure that safe and reliable collection, treatment, and disposal of wastewater to protect community health and the environment. Specific issues focussed on for the 2021 – 31 period and addressed in the plan are:

- Reductions in stormwater infiltration and inflow to the wastewater network to provide better control of peak wet weather wastewater flows.
- Staged upgrades of the existing wastewater network to meet projected growth.
- Completion of necessary upgrades to the wastewater treatment plants to meet enhanced resource consent requirements.

The external strategic environment is also of relevance in that performance of the wastewater network is governed by legislative obligations and dependant on management of the receiving water courses which fall under the control of the Waikato Regional Council. The current Three Waters Reform process and new water services bill will also impose additional requirements on our wastewater services.

The benefits of addressing these problems and the consequences of not addressing them are outlined in this AMP.

The key achievements for Wastewater activity from the previous AMP update are:

- Awarding of long term (35 year) resource consents for Tokoroa, Tīrau, Arapuni and Putāruru Wastewater Treatment Plants
- Completion of the new Anaerobic Digester and associated equipment at the Tokoroa Wastewater Treatment Plant
- Replacement of the old inlet screen with a new high efficiency screen at Tokoroa
- Completion of network model of the Putāruru Wastewater reticulation
- Construction of a new wetland at the Tīrau Wastewater Treatment Plant (Summer 2020/21).

Key Focus Areas 2021-2031:

- Undertaking a CCTV inspection of sewer pipes to ascertain the condition of pipes to assist in preparation of a long-term renewal programme.

- Construction of growth-related upgrades to the network in Putāruru previously identified from modelling work undertaken in 2018-2020
- Construction of new wetlands at Tokoroa, Putāruru, and Tirau
- Completing the wastewater network modelling of the networks to determine the priority of upgrades to meet any growth in the rest of the District and identify any constraints.
- Construction of new plant and process at the Putāruru WWTP to meet the requirements of the new consent.

Council is in the process of renewing its wastewater discharge consents for the remaining two Wastewater Treatment Plants in Tokoroa and Arapuni. Resulting from the renewal of the Putāruru and Tīrau discharge consents significant upgrade works will be required at both plants with the Putāruru upgrade due in 2026 being the initial focus during this period. Construction of the new denitrifying plant at Tokoroa Wastewater Treatment Plant during the first year of this AMP is also a key focus during this period.

The construction of wetland ponds is also intended for the Putāruru and Tokoroa Wastewater Treatment Plants with Putāruru scheduled first in 2021/22 with Tokoroa scheduled for the following year.

AMP Updates

The New Works scope, also identified as Projects-2022 below in this AMP reflect the following changes:

- - the addition of the network growth projects required for the new zoning areas in Tokoroa and Putāruru,
- - the addition of the Capital improvements in Putaruru as per the LTP Amendments[1] in August 2022.

The Assets Covered in this AMP

Council staff manage around 170 km of sewer pipes,18 pumping stations, and 4 treatment plants that make up the District's wastewater network. Each year the wastewater network carries an average 1,860,000 cubic metres of wastewater to the Council treatment plants, where it is treated ensuring that the effluent is disposed of to comply with environmental standards.

Council owns and operates four reticulated sewage schemes in the urban communities of Tokoroa, Putāruru, Tirau, and Arapuni.

Levels of Service for Wastewater

Customers' expectations of the service have been identified and subsequently defined in terms of Levels of Service and Performance Indicators that can be monitored, measured, and reported.

Council has adopted a series of measures which are intended to indicate how well the wastewater infrastructure contributes to community outcomes and levels of service. Both Customer Service Levels and Technical Standards are used.

This plan supports Council providing:

- Wastewater collection and treatment systems which protect public health and provide residential, commercial and industrial properties in the District with safe and reliable disposal and treatment of wastewater.
- Wastewater infrastructure that meets the expected growth requirements
- Wastewater services which comply with regulatory and consenting requirements
- Management of the wastewater activity in a financially sustainable way.

The key LOS relate to treated effluent quality, system performance, continuity of service and responding to faults. LOS measures for the above services are contained within the Councils 10-year plan and include a number of regulatory and DIA mandatory performance measures. Key performance indicators include environmental compliance for treatment performance and ensuring wastewater is contained in the network.

[1] ECM_598789_v6_Long Term Plan Amendment update.docs

The AMP also sets out both customer and technical levels of service in the areas of network performance, wastewater overflows, odour events as well as responsiveness, consent compliance, fault and complaint occurrence and planning.

Levels of service are expected to change in the following areas, Higher treatment standards resulting from the new consents, higher levels of network and treatment reliability associated with greater proactive investment in inspection, condition assessment and maintenance, and higher trade waste standards as part of measures to ensure new consenting requirements are achieved.

The table below shows the changes in customer satisfaction levels over the past three years for all of the three water activities (Water, Wastewater & Stormwater). The satisfaction figures discount those who answered “don’t know” when they were asked for their opinion of the service. There has been a change in methodology between 2019 and 2020 when online or free post returns were allowed, and this may have impacted on the satisfaction percentages shown.

Council Activity	2018 Satisfaction Level	2019 Satisfaction Level	2020 Satisfaction Level	2020 Sample Size
Overall satisfaction with Council’s **Water Management**	85%	84%	**80%**	**361**
Wastewater system reliability	95%	97%	**98%**	**275**
How Council treats and disposes of wastewater	94%	96%	**94%**	**186**

Planning for the future

Council expects that the demand from existing sources of wastewater will generally not exceed capacity within the 10-year planning horizon of this AMP.

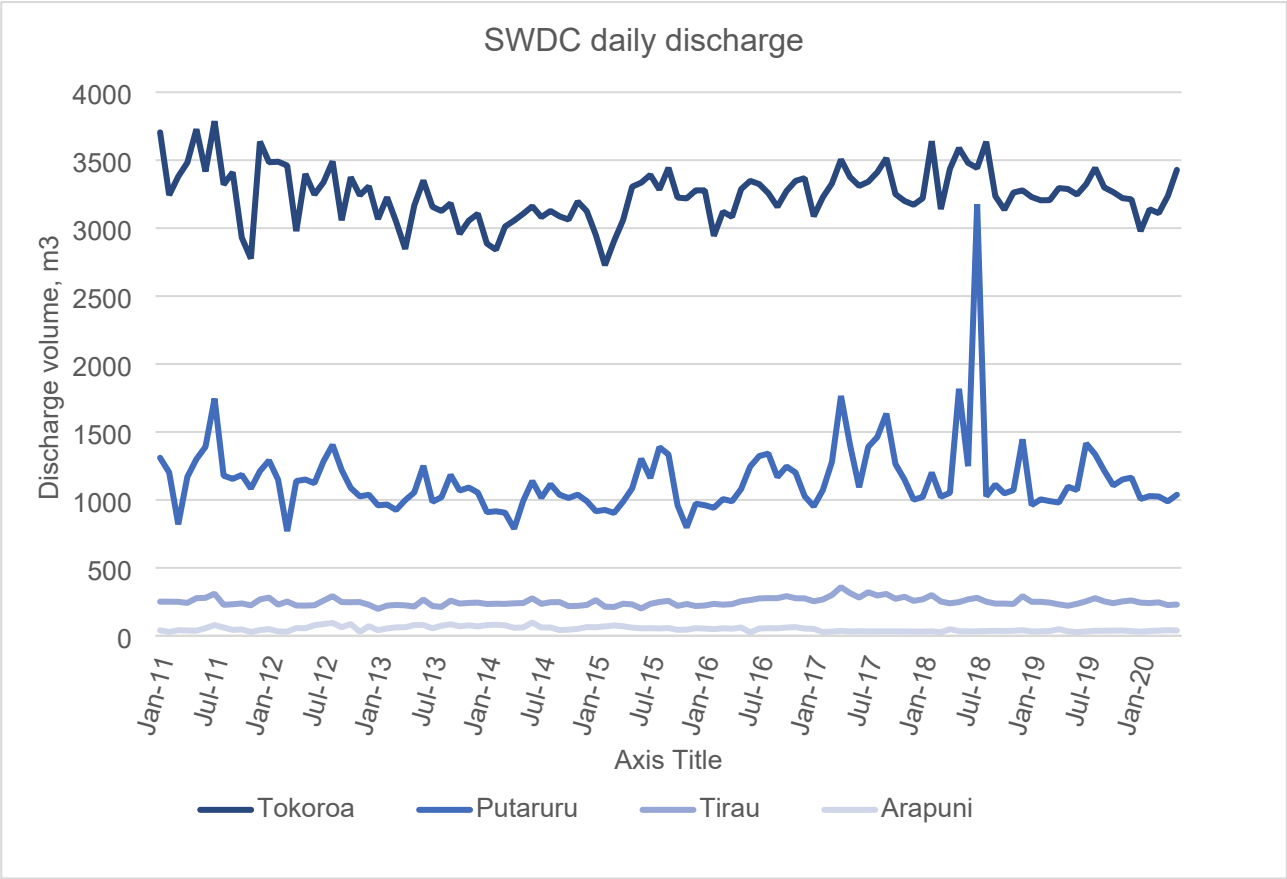
The following legislative requirements apply to wastewater management:

- Local Government Act 2002 (and amendments)
- Health Act 1956
- Health and Safety At Work Act 2015
- Resource Management Act 1991 (and amendments)
- Civil Defence Emergency Management Act 2002 (Amended 2016)

Refer AMP Section 4.2.4 for a comprehensive list of legislations.

Demand

Tokoroa, Putāruru Arapuni and Tirau wastewater discharge volumes have been steady over the past five years, in line with limited township population change. Refer Figure below.



The following key issues have been identified for the 10-year planning period:

- Reducing inflow and infiltration to the network.
- Management of trade waste.
- Renewal of resource consents and anticipated higher standards.
- Residential and Industrial growth in the District
- Climate Change

The latest 2018 Census data has revealed the District having an estimated population of 24,800 in 2018 and 25,100 in 2019, which is just over a 1% increase from 2018. The majority of the growth is anticipated to be in the north of the District focused on Tīrau and Putāruru.

The impacts of proposed developments in Putāruru have been modelled to measure the impacts on sewerage treatment both on site, and at Councils treatment facilities. From this modelling a number of upgrades are proposed to both the reticulation and treatment plant to enable the wastewater infrastructure to cope with increased flows.

Increased sewage flows can be expected from developments of recent industrial subdivisions in Tokoroa, Putāruru, and Tīrau communities during the planning period, and infill developments in Tīrau and Putāruru growth areas.

Lifecycle Management

The Council owns and manages four separate wastewater systems in the urban areas, using its professional engineering staff and external resources where required.

The wastewater assets include:

- Reticulation pipe work.
- Manholes and inspection points for access into the wastewater network.

- Wastewater pump stations.
- Electrical controls to monitor the pumping systems.
- Rising mains from pump stations.
- Wastewater Treatment Plants.
- Discharge structures.

	Tokoroa	Putāruru	Tirau	Arapuni	Total
Reticulation, km	118.7	36.9	9.2	4.5	169.2
Manholes (reticulation network)	2,266	689	167	87	3,209
Inspection points	0	0	4	0	4
Pump stations	9	6	3	0	18
Electrical controls	30	29	27	3	89
Rising mains, km	4.1	2.0	1.0	0.4	7.6
Treatment plants	1	1	1	1	4
Discharge (Outlet) structures	1	1	4	0	6

Details of these assets are recorded in our management software system AssetFinda. This enables the individual components to be tracked including size, age, depreciated and replacement value, and reports can be produced to predict theoretical replacement requirements.

Maintenance and Operations Costs

Wastewater plants are operated, and assets managed on a day-to-day level by the Three Waters Unit (‘the maintenance contractor’) part of the Assets Group. This includes provision of water quality sampling, with laboratory testing under subcontract.

The general requirements of the expected service levels are:

- ‘To provide trained staff, plant and material resources to effect prompt and efficient routine maintenance of Council’s sewerage systems.
- To ensure wastewater discharges meet their relevant resource consent requirements.
- To receive and treat sewage at each of the sewage treatment plants and monitor effluent water quality as specified.
- To inspect, schedule and program required maintenance and inspections on an annual basis.
- To execute the works to specification requirements in a safe, efficient, and timely manner that will enhance the Council’s assets while minimising any inconvenience to asset users.
- To maintain a close working relationship with the Audit & Compliance Section of Councils Assets Group to enhance the liaison process and ensure a good understanding of what is required’.

Network (pipes, manholes and other buried assets) are not expected to require significant renewal over the early part of this planning period. Current forecasts based on age alone indicate a significant spike in renewals in the latter half of this AMP. Additional inspections and analysis are required to assist in smoothing out this spike by either deferring or bringing forward some or all of these forecast renewals. Pumping and

treatment plant assets have shorter lives than the pipe reticulation system, and more frequent renewals are required.

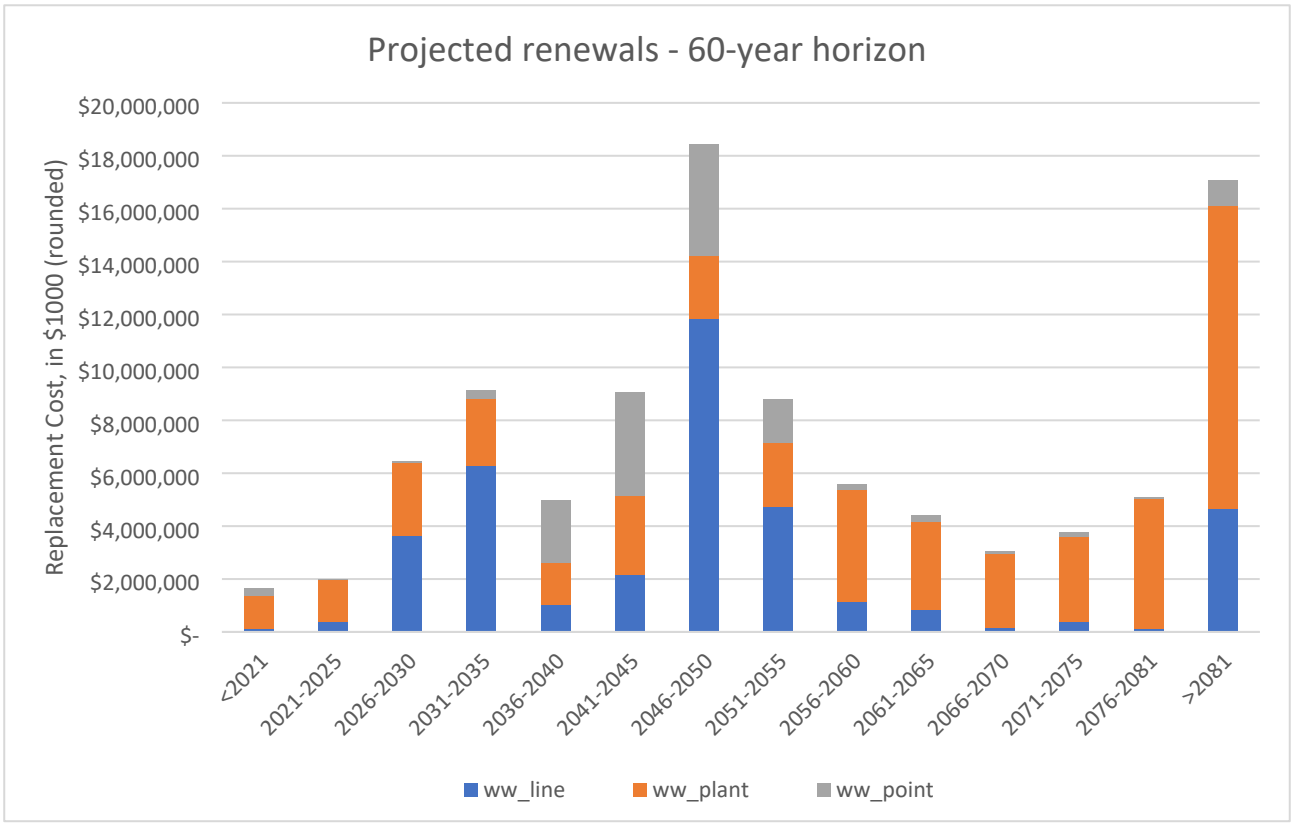
Replacement costs for the treatment plants and reticulation over next ten years are expected to be in the order of $20 million due to the need to upgrade the Putāruru and Tokoroa Treatment Plants to meet expected discharge consent conditions.

The graph below illustrates the post-WW2 infrastructure expansion phase, which is clearly visible in the centre of the chart.

Capital Renewals

Infrastructure assets all have their particular useful lives, during which they are fit for the purpose of providing the required service reliably and effectively. When they are no longer capable of providing that service, a decision is required regarding continued operation of the service.

The figure following shows the projected future asset renewals required over the next 60 years.



Managing Risk

Sustainable and reliable delivery of the Wastewater service requires careful consideration of the various types of risk associated with the service.

The major risks addressed in this Asset Management Plan include:

Business Risk

The Corporate Risk Management Policy addresses community outcomes, vision statement and strategic themes. Full details can be found in the South Waikato Risk Register and Risk Profile, which ranks the risks and includes control measures, where they exist.

Asset Risk

An Asset Criticality and risk Assessment report in 2007 addressed the consequences of infrastructure failure and identified the critical assets that required further investigation in order to ensure that they would continue to perform reliably delivering the agreed levels of service. Subsequent to that review our understanding of criticality and risk has evolved further and additional work is underway to further refine our critical assets.

Critical assets are those assets which have the highest consequences in terms of disruption in services and financial, environmental, and social cost should they fail. For the wastewater activity the assets in this category are:

- Large diameter wastewater pipes
- Wastewater treatment plants
- Assets with critical customers
- Wastewater pipes adjacent to sensitive environments

Mitigation measures to address these risks are covered in this plan, Resilient infrastructure is able to deal with significant disruption and changing circumstances as a result of the occurrence of natural hazards such as seismic and volcanic events.

Business Continuity Risk

Council has developed Business Continuity Plans that address the continuation of service delivery in the event of a disaster or failure of critical infrastructure. This is also linked to the regional lifelines program involving all territorial authorities in the greater Waikato and other utility providers.

Expenditure components are as follows

Maintenance and operating costs are expensed in the year they are accrued. The capitalisation threshold for assets has been set at $5,000. Repairs to pipe failures will however only be capitalised if the length of new replacement pipe installed exceeds 12 meters (typically two pipe lengths). This is because a shorter repair would be abandoned along with the old assets in a future pipeline replacement. It therefore does not extend the overall life expectancy of the original pipe.

Operating Costs: It covers costs of operating and maintaining the wastewater treatment plants and reticulation, including fault repairs.

Support Costs: This item covers the share of Council support costs incl. overheads apportioned to Wastewater.

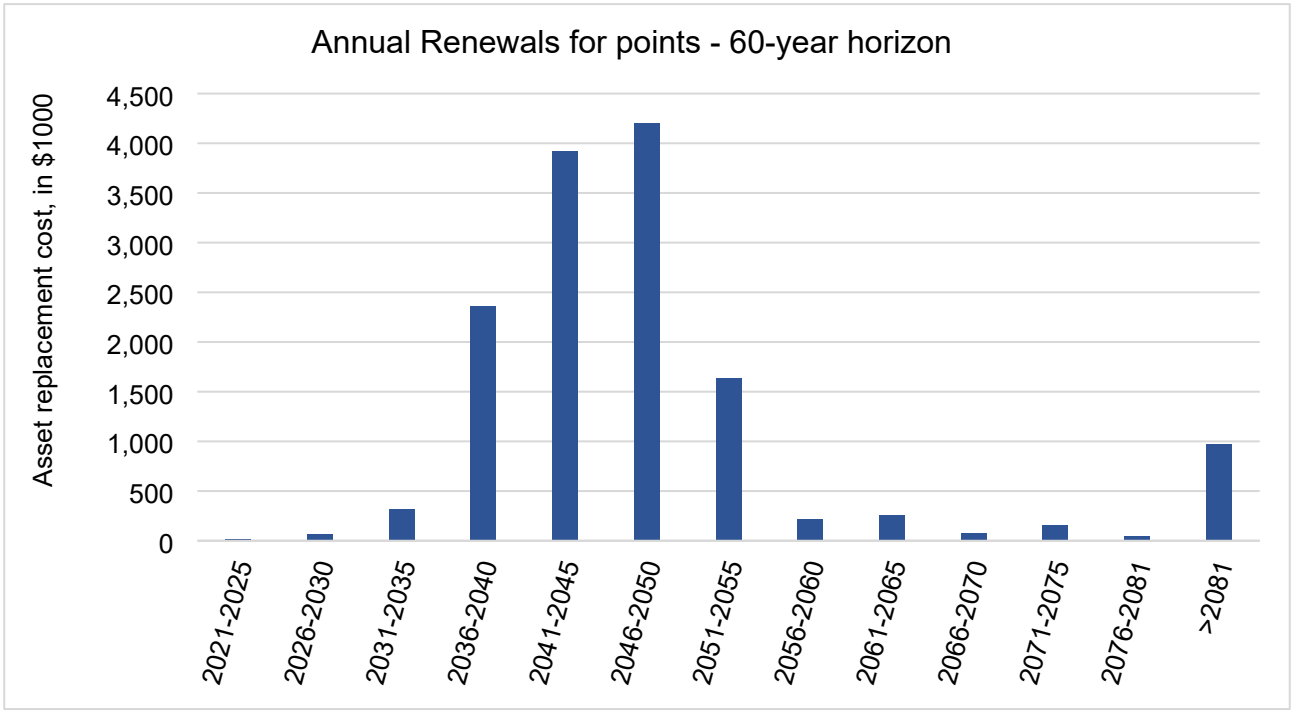
Depreciation: Both renewal of existing assets and investment in new assets drive a gradual increase in depreciation charge over the plan period. The contribution of the older pipe assets to depreciation charges decreases as their value diminishes toward the end of their lives. Depreciation is based on the useful lives of assets. Useful lives vary depending on many factors:

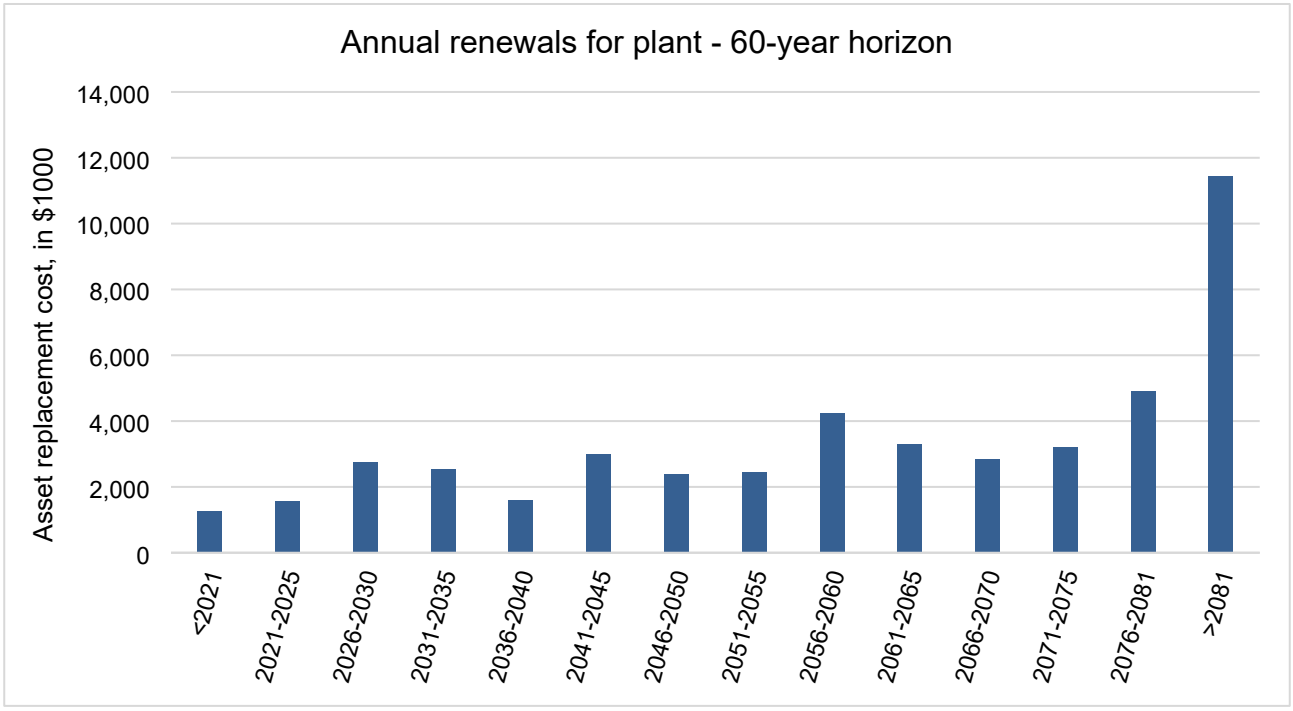
- Mechanical and electrical plant depreciate faster than reticulation pipes.
- Different pipe materials have different life expectancies.
- Different historical installation standards and service conditions also affect lives.

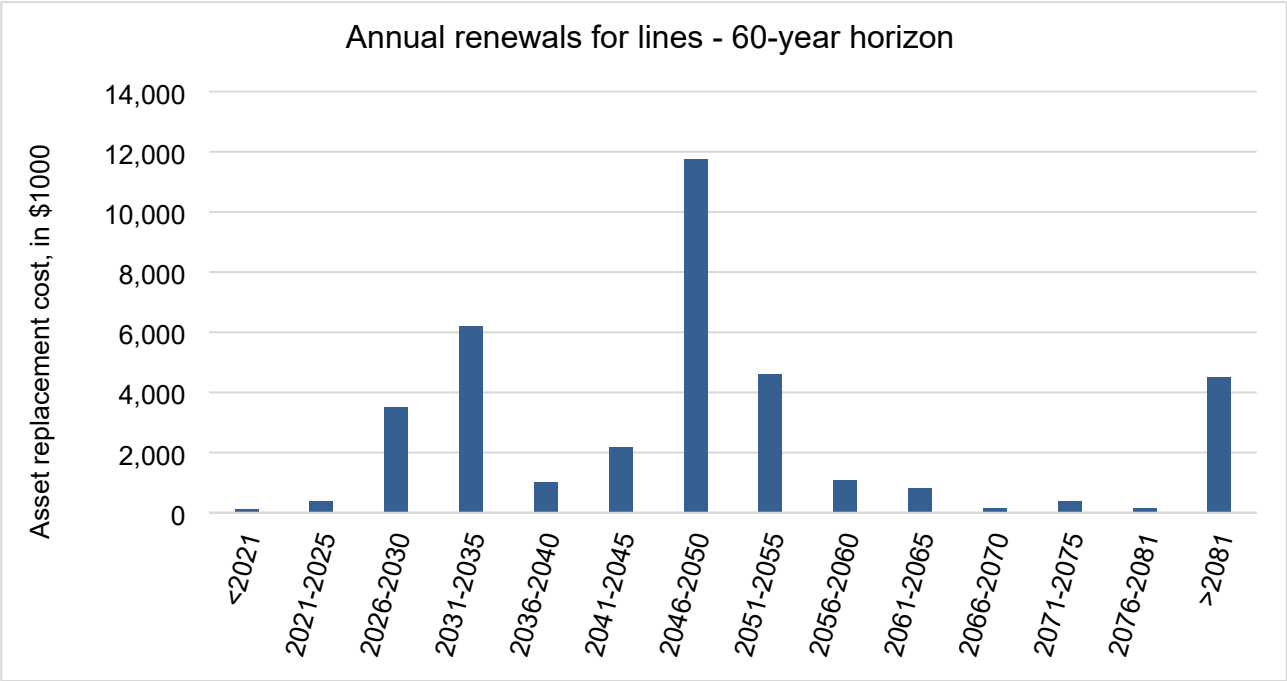
Interest and Principal: New works are generally funded by borrowing. Interest payments, and repayment of principal are an operating expense.

New Works: Capital investment is required to service additional consumers, to manage risk or for a change in level of service to meet residents' expectations or changes in legislative/consent requirements.

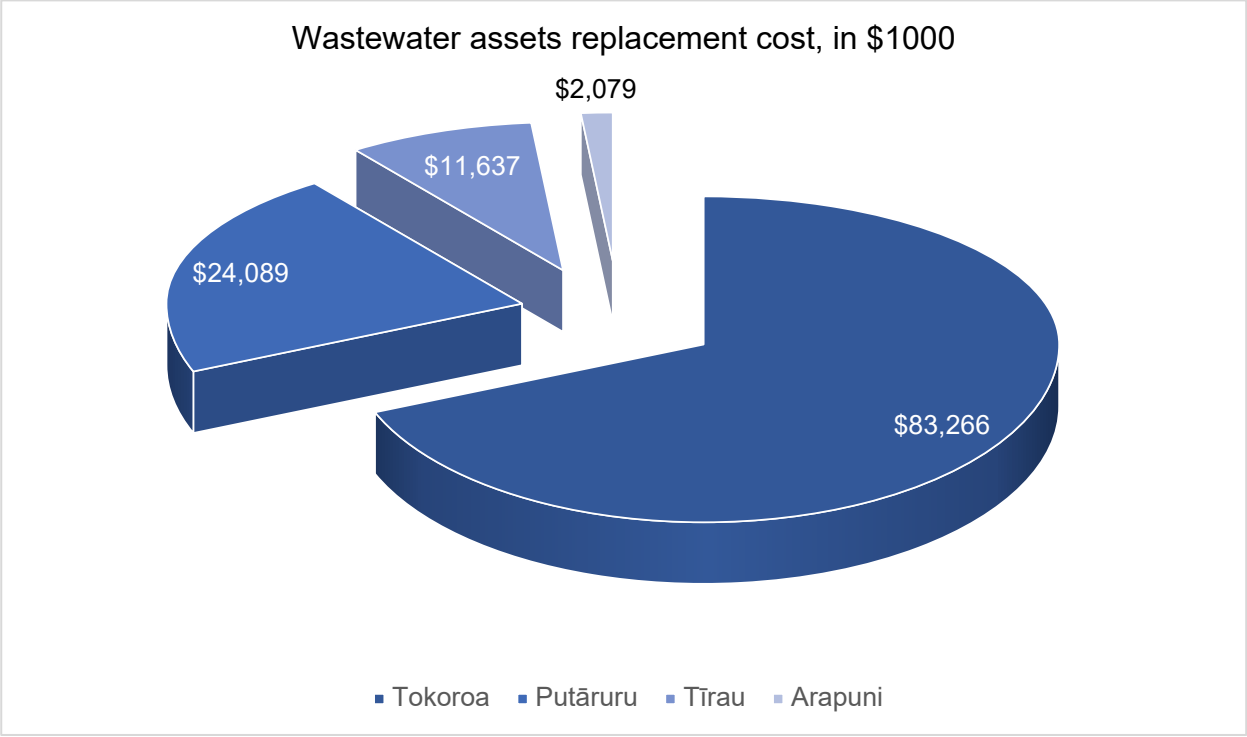
Renewals: This capital cost is for replacing reticulation system component and treatment plant equipment to maintain the agreed environmental (plant discharge quality) levels of service. Renewal or restoration of assets is required to ensure that the service potential of the assets is maintained and that the level of service can continue to be delivered. It is funded by drawing from the depreciation reserve.





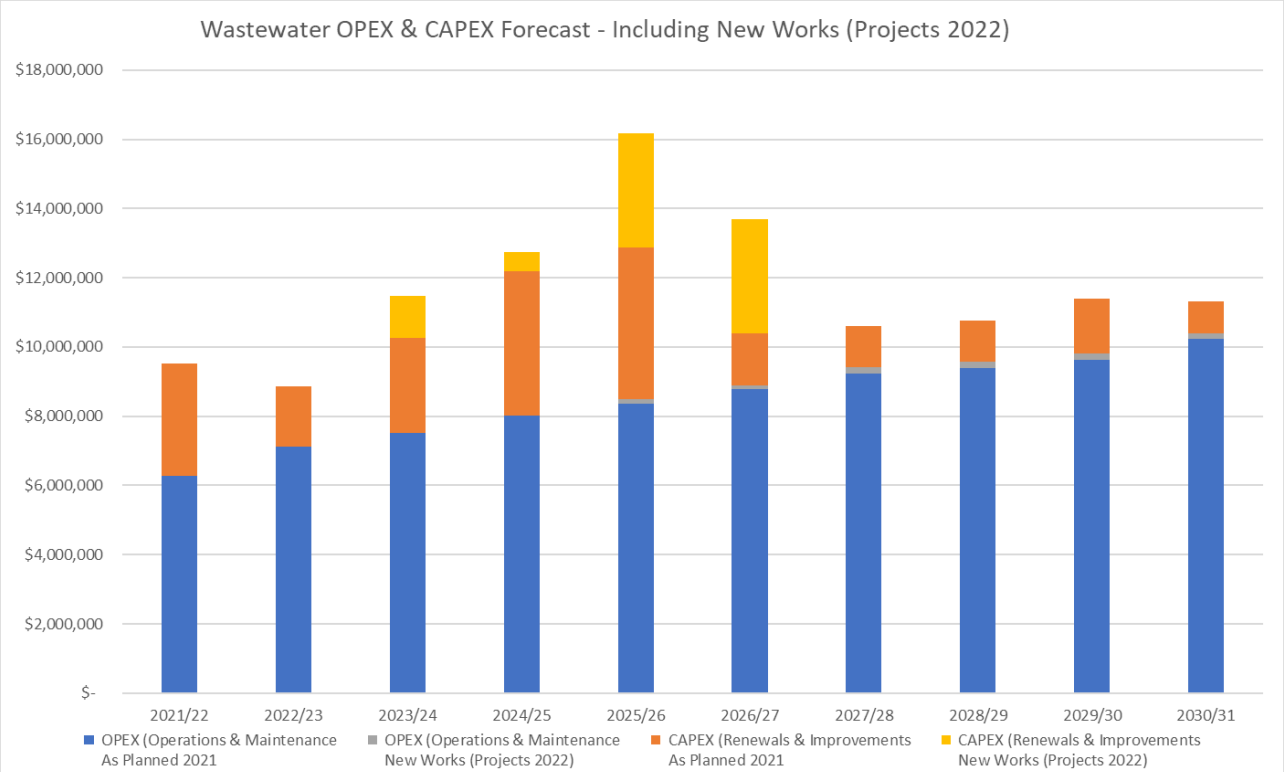


The main cost-increase over this planning period is the creation of new wastewater treatment assets and the increase operational costs resulting from the increase in treatment levels required.



Financial Forecasts LTP 2021

The table below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation. The chart below includes the latest Growth, Improvements and Renewals' amendments made in 2022.



OPEX & CAPEX EXPENDITURE	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX (Renewals & Improvements As Planned 2021	$ 3,253,000	$ 1,754,500	$ 2,742,000	$ 4,178,500	$ 4,400,000	$ 1,506,000	$ 1,186,000	$ 1,191,000	$ 1,592,372	$ 911,000	$ 22,714,372
OPEX (Operations & Maintenance As Planned 2021	$ 6,281,422	$ 7,111,905	$ 7,522,061	$ 8,005,880	$ 8,367,405	$ 8,778,893	$ 9,223,680	$ 9,402,378	$ 9,621,643	$ 10,223,058	$ 84,538,325
CAPEX (Renewals & Improvements New Works (Projects 2022)	$ -	$ -	$ 1,203,125	$ 553,125	$ 3,290,291	$ 3,290,291	$ -	$ -	$ -	$ -	$ 8,336,832
OPEX (Operations & Maintenance New Works (Projects 2022)		$ -	$ -	$ 6,500	$ 117,125	$ 117,125	$ 182,931	$ 182,931	$ 182,931	$ 182,931	$ 972,473
Total	**$ 9,534,422**	**$ 8,866,405**	**$ 11,467,186**	**$ 12,744,005**	**$ 16,174,821**	**$ 13,692,309**	**$ 10,592,611**	**$ 10,776,309**	**$ 11,396,946**	**$ 11,316,989**	**$ 116,562,002**

Improvement Plan

Council's asset management target is to achieve the "intermediate" level, which is considered to be appropriate for an organisation of its size. Following guidance from the Office of the Auditor General and the NAMS manual, a number of Improvement Plans have been developed and implemented historically, while others are ongoing.

Further improvement proposals are based on a review of the current status of compliance with the requirements of "intermediate" level.

Conclusion

This AMP sets out programs for operating, maintaining, renewal and development of the Wastewater Activity over the next thirty years that will ensure that the required level of service is delivered to the community, the service potential of the assets is maintained for future generations, and that the growth of the District is provided for.

1 Introduction

1.1 Background

This Asset Management Plan (AMP) for Wastewater describes in detail how the activity will be managed to support the Council's Vision, Outcomes and Strategies for the South Waikato District, particularly over the next 10 years as encapsulated in the Long-Term Plan 2021 - 2031

This AMP covers:

1. Why the Council manages wastewater
2. How wastewater management contributes to Council's Strategy
3. What level of service we will provide
4. Planning for the future
5. How we deliver our services
6. Quantifying and managing the issues and risks
7. Lifecycle management plans of Wastewater's assets
8. Projected costs of the service for the next 10 years
9. Planned improvements to asset information and management
10. To comply with the requirements of relevant legislation

Forward planning for the 3 waters is based around communities of interest which then feeds into an integrated management regime for the District, resulting in efficiencies across the District's water supply schemes, wastewater treatment services and management of stormwater.

1.2 Purpose

The purpose of this Asset Management Plan is to ensure that assets are planned, provided, operated and maintained in a sustainable and cost-effective manner, so that they provide the required level of service for the present and future customers.

The Wastewater AMP supports the purpose by:

- Demonstrating responsible management and operation of Wastewater assets which represent a significant, strategic, and valuable asset belonging to the South Waikato District Council
- Justifying funding requirements
- Demonstrating regulatory compliance, of note is section 94(1) of the LGA 2002 which in summary requires the Long-Term Plan (LTP) to be supported by:
  - Quality information and assumptions underlying forecast information
  - A framework for forecast information and performance measures that are appropriate to assessing meaningful levels of service
- Demonstrating clear linkage to community agreed outcomes with stated levels of service

1.3 Objectives

The objectives of this Wastewater AMP are to demonstrate that Council:

- Delivers the required level of service to existing and future customers in the most cost-effective way
- Understands how the outcomes delivered by the assets link to the wider community outcomes
- Understands what asset capacity will be required in the future, and what issues drive this capacity requirement
- Has an ever-improving knowledge of its asset locations, ages, and service conditions

- Has robust and transparent processes in place for managing, operating, maintaining, renewing and extending assets
- Has adequately considered the classes of risk its activities face, and has systematic processes in place to mitigate identified risks
- Provides adequate funding for asset provision, operations, maintenance, renewals, extensions and depreciation
- Delivers outcomes that are aligned to the community's wishes and to other internally and externally imposed levels

1.4 Asset Management Development Focus

The focus previously has been the implementation and development of asset management practices associated with:

- Improved knowledge of the assets
- Ensuring the asset register was at the appropriate standard
- Continuity of the three waters asset knowledge within Council
- Consultation framework and implementation
- Compliance with resource consent conditions

Improvements to Wastewater asset management processes have been identified and over the next three years will focus on the areas of:

- Plant control and monitoring system
- Development and improvements to individual wastewater unit processes.
- Reduced inflow/infiltration to the wastewater treatment plant
- Reduced inflow/infiltration to the wastewater treatment plant
- Renewal of the four wastewater resource consents for the District.

Asset Management

- Sustainability to enable long term options to be considered
- Condition assessments of critical assets

Wastewater Network

- Network Renewals – Continuation of the reticulation renewals programme with increased emphasis on critical main condition assessments

Risk Management Practices and Procedures

- Develop an emergency Response Plan for the wastewater treatment plants
- Review SOP's
- Critical assets - integrate criticality into the on-going operation, renewals, and capital programme for Wastewater service

1.5 Asset Management Policy

1.5.1 Asset Management Policy Objective

The objective of Council's Asset Management Policy is to ensure that Council's service delivery is optimised to deliver agreed community outcomes and levels of service, manage related risks, and optimise expenditure over the entire life cycle of the service delivery, using appropriate assets as required. The Asset Management Policy requires that the management of assets be in a systematic process to guide planning,

acquisition, operation and maintenance, renewal, and disposal of the required assets. Delivery of service is required to be sustainable in the long term and deliver on Council's objectives. This Asset Management Policy sets the appropriate level of asset management practice for Council's Wastewater Activity.

1.5.2 Asset Management Policy Principles

The following principles will be used by Council to guide asset management planning and decision making:

- Effective consultation to determine appropriate Levels of Service
- Ensuring service delivery needs form the basis of asset management
- Integration of asset management within and across Council utilising corporate, financial, business and budgetary planning in activity management plans and Council's LTP to demonstrate this
- Integration of asset management within Council's strategic, tactical and operational planning frameworks
- Informed decision making taking a lifecycle management and intergenerational approach to asset planning
- Transparent and accountable asset management decision making
- Sustainable management providing for present needs whilst sustaining resources for future generations.

1.5.3 Structured Assessment of Asset Management Practice

In 2014, Council undertook a structured assessment of the appropriate level of asset management practice for the water, wastewater, and stormwater assets. This structured assessment follows the guidance provided in Section 2.1.2 of the IIMM 2015. The results of this assessment are shown in Table 1.1.

Table 1.1: Asset Management Practice Assessment Results

Criteria	Assessment	Commentary
Population	Population	Intermediate (Core Plus)
District Wide Risks	District wide risks	Intermediate (Core Plus)
Costs and Benefits	$6.1 million (annual expenditure)	The wastewater asset budgets represent a significant portion of Council expenditure and therefore higher risks if AM practice is not at an appropriate level. These budgets also allow more scope to develop asset management practice as appropriate
Legislative Requirements	Level of service focus	Level of service driven approach, this may exceed or comply with legislative requirements
Size, Condition, Complexity of Assets	Average	Wastewater assets are generally in average condition and meet Customer needs. Creating new assets or changes to existing assets occurs after extensive community consultation
Risks Associated with Failures	Average	Generally physical risks have been assessed to be low. Work is on-going in investigating management, renewal and service level delivery risks. A criticality study has been undertaken and physical risks are understood
Organisational Skills and Resources	Average	SWDC is a mid-sized local authority with competent management and services in place. Attracting and retaining staff is an ongoing issue, and partnerships with consultants are integral to achieving a range of functions. Further analysis of appropriate resource levels for water asset management is required
Customer Expectations	Average	The District wastewater assets are of a high standard, the community has high expectations of their ongoing development and maintenance Comprehensive Levels of Service consultation undertaken in 2015 so services and affordability issues are understood
Sustainability	A corporate sustainability policy will be developed as required by legislation or community demand	South Waikato District Council is still in the process of developing its corporate sustainability policies. This will include incorporating legislative changes and any national or regional policies or plans and will also be focussed on economic sustainability and affordability
Final AM Level	Intermediate (Core Plus)	Analysis of factors suggests that asset management practice should be more sophisticated than Core, with an emphasis on sustainable delivery of agreed service levels and ensuring there is provision for adequate funding to meet quality and performance standards

1.5.4 Implementation and Review of Policy

The Asset Management Policy (adopted in 2008) set the appropriate level of asset management practice for SWDC infrastructure assets at "core plus" which was described in IIMM 2006 as lying between "core" and "advanced". The updated IIMM 2011 relabelled "core plus" as "intermediate" for the same level of asset management practice.

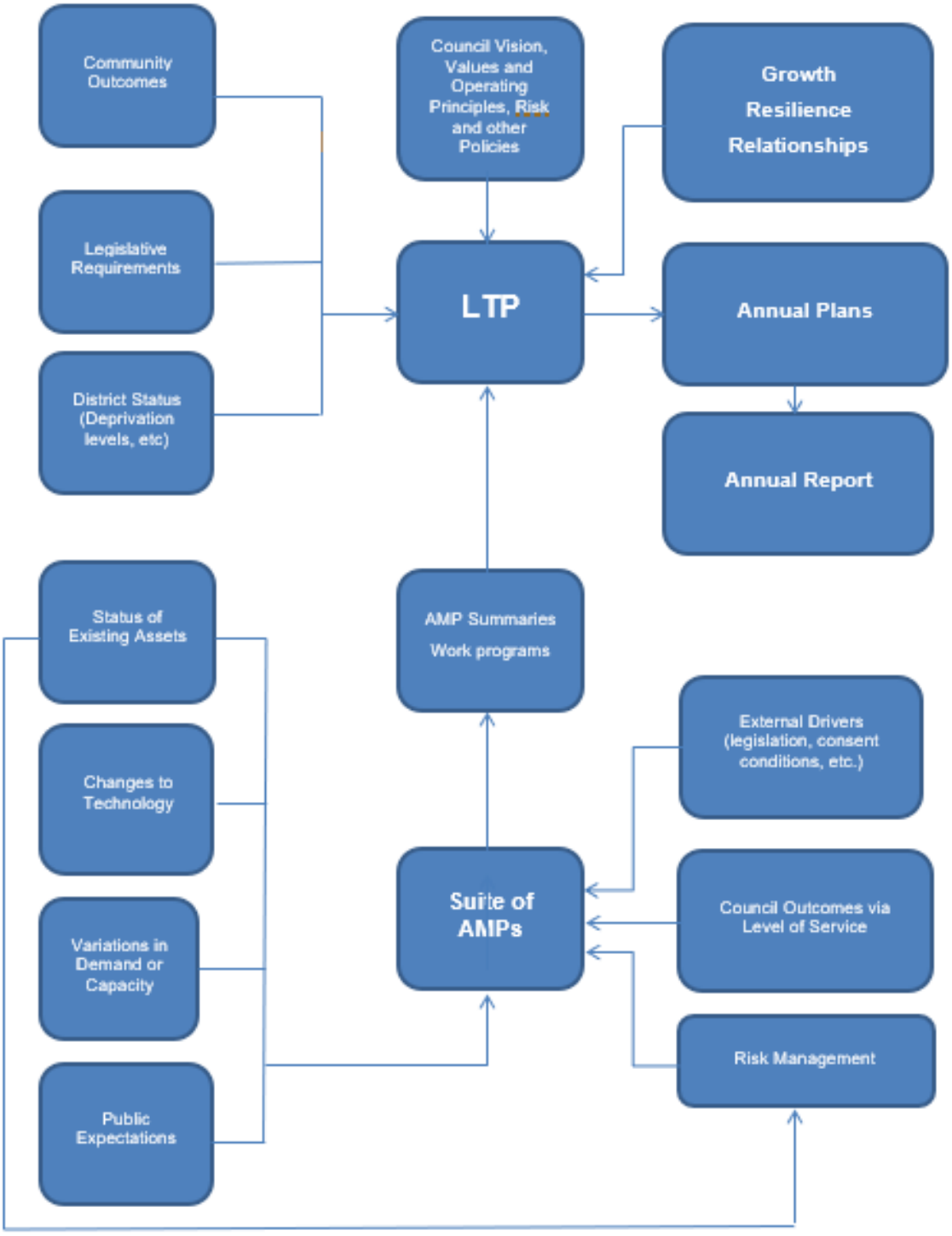


Figure 1.1 Linkages between AMP, LTP, Policy and Planning Documents, and the Key Council Processes and Drivers

This Asset Management Policy is implemented through the AMPs and the LTP. The next full review of this policy shall be completed as part of the AMP's review and update during this three-year AMP period.

AMPs are reviewed triennially to identify the status of compliance with the target level of asset management. The reviews identify any gaps and improvements that are to be implemented in subsequent AMPs' improvement plans.

1.5.5 Asset Management Implementation Strategy

Council staff have carried out a detailed analysis of the current level of asset management with reference to the appropriate level as outlined in this Policy. The review has examined asset description, levels of service, managing growth, risk management, asset life cycle decision making, financial forecasts, planning assumptions and confidence levels, improvement programmes use of qualified persons and Council commitment to asset management planning.

From this detailed analysis Council's level of achievement has been assessed. Any gaps in appropriate asset management practice were identified and have been shown on the AMP improvement plan.

1.6 Linkages to other Plans

The AMP provides input into the LTP which following community consultation provides the basis of the Wastewater activity levels of service. The AMP provides linkages to the Annual Plan, LTP and other key documents. The AMP sits at a tactical level between the LTP (a strategic document) and a myriad of activity and process plans (operational documents).

1.7 Description of the Wastewater Activity

Council provides reticulated wastewater services in the urban areas of Tokoroa, Putāruru, Tirau and Arapuni which covers 82% of the District's population. Council does not have reticulated wastewater schemes corresponding to the reticulated water supplies in Athol and Lichfield.

Table 1.2 Description of Community Wastewater Schemes

Community	System Information			Comments
Tokoroa	**Population**	**14,498**		**NZ Statistics, 2019**
	Properties Connected	5,394		Eff. June 2020
	Pump Stations	9		
	Treatment Plants	1		
	Manholes	2,266		
	Reticulation Length	119	km	
	Replacement Cost - Total Scheme	$15,092,377	$	Eff. 19 Mar 2019[2]
	Average Daily Flow	4,177	m^3	Jun-2019 to May-2020
Putāruru	**Population**	**6,687**		**NZ Statistics, 2019**
	Properties Connected	1,760		Eff. June 2020
	Pump Stations	6		
	Treatment Plants	1		
	Manholes	689		
	Reticulation Length	37	km	
	Replacement Cost - Total Scheme	$5,708,979	$	Eff. 19 Mar 2019[3]
	Average Daily Flow	1,129	m^3	Jun-2019 to May-2020
Tīrau	**Population**	**700**		**Estimate**
	Properties Connected	401		Eff. June 2020
	Pump Stations	3		
	Treatment Plants	1		
	Manholes	167		
	Reticulation Length	9	km	
	Replacement Cost - Total Scheme	$3,679,019	$	Eff. 19 Mar 2019[4]
	Average Daily Flow	247	m^3	Jun-2019 to May-2020
Arapuni	**Population**	**300**		**Estimate**
	Properties Connected	120		Eff. June 2020
	pump Stations	Nil		
	Treatment Plants	1		Plus 2 septic tanks
	Manholes	87		
	Reticulation Length	4	km	
	Replacement Cost - Total Scheme	$206,423	$	Eff. 19 Mar 2019[5]
	Average Daily Flow	36	m^3	Jun-2019 to May-2020

Consumers' properties are connected to the public reticulation systems through pipes referred to as service connections. This pipe is generally the property owners' responsibility and services only one lot. In some instances, the connections are shared by more than one property, and Council may have taken over the "common drains" as part of the public sewer to avoid confusion over responsibilities.

[2] Beca Valuation, 30 June 2019

[3] Beca Valuation, 30 June 2019

[4] Beca Valuation, 30 June 2019

[5] Beca Valuation, 30 June 2019

The public network includes larger pipes and manholes where changes in grade or direction occur. Where the topography dictates, pumping stations are located to lift effluent back to gravity pipe level.

All wastewater is brought to treatment plants – one for each reticulated area. These remove harmful pollutants and pathogens from the effluent, rendering it safe to discharge to the environment.

Treated wastewater is discharged into Whakauru Stream for Tokoroa, Oraka Stream for Putāruru and for Tirau, and into the ground at Arapuni. Each of these discharges is subject to resource consents which are listed in Appendix G of this AMP.

The Wastewater Activity requires the infrastructure mentioned above to be operated, maintained, renewed, added-to, and in rare cases, dismantled or abandoned.

In addition to these physical activities, administrative activities include:

- Responding to requests from consumers or other residents
- Maintaining or applying for resource consents
- Recording and costing of expenditure
- Complying with accepted standards through:
  - Testing the discharged water
  - Supervising the design and carrying out of physical work
  - Managing the asset inventory

This Asset Management Plan records these activities, providing a reference to policies, management decisions and programmes. At the same time, it is intended to demonstrate that the activity is being conducted in a responsible and cost-effective way that is sustainable over the long term. Table 1.2 details the extent of the four reticulated sewage schemes.

The replacement cost of each the schemes is summarised in Table 1.3.

Table 1.3 Summary of historical wastewater assets replacement costs

Town	Replacement Cost ($000) 30/06/2008	Replacement Cost ($000) 30/06/2010	Replacement Cost ($000) 30/06/2013	Replacement Cost ($000) 30/06/2019	Replacement Cost ($000) 30/06/2021	Replacement Cost ($000) 30/06/2022
Tokoroa	$30,868	$31,320	$41,581	$48,353	$51,708	$88,004
Putāruru	$11,372	$11,144	$13,784	$16,204	$18,214	$25,976
Tirau	$4,340	$4,679	$5,597	$6,140	$6,731	$8,773
Arapuni	$892	$931	$1,259	$1,439	$1,621	$2,214
Total	**$47,472**	**$48,074**	**$62,221**	**$72,136**	**$78,274**	**$124,967**

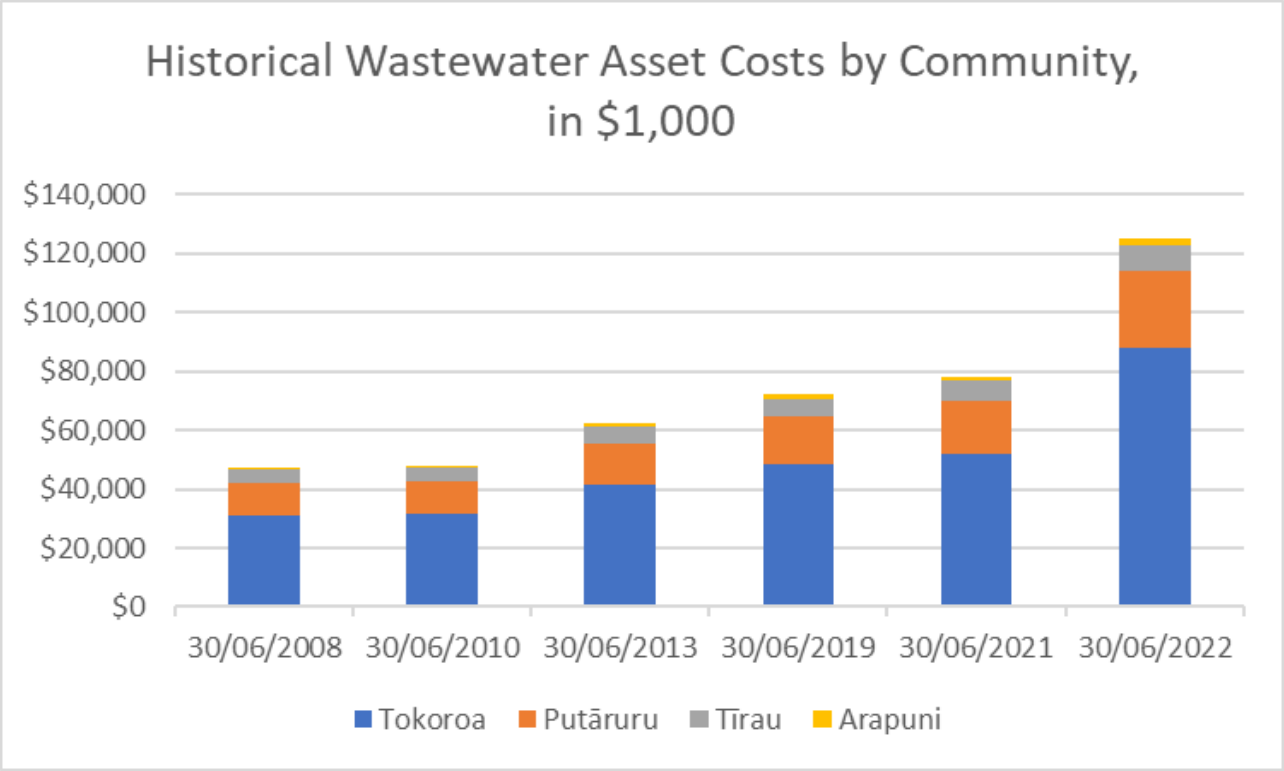


Figure 1.2 Historical wastewater asset replacement costs by community

There has been increase in Replacement Cost since the 2019 valuation, due the new Anaerobic Digester and associated equipment at the Tokoroa Wastewater Treatment Plant. Unit rate increase (typically 7-20%) and a change in valuation methodology for pipelines to a banding technique from individual costing (average 212% increase) were an additional source of the observed increase in valuation. Asset quantity increases, base lives reviews, and remaining life adjustments have also impacted the reported valuation.

In addition to these reticulated areas, there are also Non-Council Wastewater Disposal Schemes associated with:

- The Settlements at Lichfield and Athol
- The Fonterra Cheese Factory at Lichfield
- The Fonterra Factory at Tirau
- The industrial area surrounding Oji at Kinleith
- Schools at Lichfield, Kuranui and Waotu
- Marae at Ngatira, Ongaroto, Pikitu, Mangakaretu, Whakaaratamaiti and Ruapeka
- The Okoroire Hotel
- Private dwellings accommodating about 4,200 people throughout the District

Council also owns and operates a number of public toilets which are not connected to reticulated wastewater. These are detailed in Section 8 of the Water & Sanitary Assessment. Public Toilet Asset Management is covered in the Parks & Reserves AMP.

1.8 Issues Arising

1.8.1 Issues Arising Within the Ten-Year Planning Horizon

The following describes the future issues that are expected to arise the current 10-year planning horizon period.

Table 1.4 Issues Arising Within the Ten-Year Planning Horizon

Description	Will/ May Arise	Resolution/Comments
Reductions to Phosphorus and Nitrogen in the discharge required from Regional Council	Will Arise	Options has been investigated to determine the most cost-effective solution, as part of the consent renewal process and are currently being implemented for Nitrogen as part of the Three Waters funding. Phosphorus removal is now only required for 2032.
Increase in rainfall intensity	Will Arise	Council will have to carry out Inflow/Infiltration inspections.
Establishment of industry that has discharge loadings	May Arise	Trade Waste agreements to be signed by new industry.
Growth in the District	Will Arise	Council has budgeted to undertake modelling of its network during the previous AMP period to determine which sections of its network will require upgrading. It is expected that this will be over the long term the necessary upgrades and improvements to meet the forecast growth.

1.8.2 Issues Arising Beyond the Ten-Year Planning Horizon

The following issues may arise beyond the 10-year planning horizon:

Future Population

After a long period of population decline, the district population now shows some growth up by 1.7% in 2017. The increased was comprised of natural growth and 50% net migration. The major driver for migration has come from rising house prices in Auckland and Hamilton which has resulted in population movement to the region.

It is anticipated that population will continue to experience an increase over the next 30 years, providing an additional pool of ratepayers contributing to the cost of running and maintaining our infrastructure. However, the proportion of people aged 65 years or older is also expected to increase which means more people on fixed income who may have a limited ability to pay for rate increases.

In terms of demand for infrastructure, some need of our community will change. Growth in the number of households will determine the demand for increased water and wastewater reticulation.

Climate change

Climate change is likely to result in more extreme storm and drought events brought about by changes in rainfall, wind and temperature. This will require Council to assess the effects of key climate influence on water, wastewater, and stormwater infrastructure.

Natural Hazards

Natural Hazards such as earthquakes and volcanic eruptions have the potential to cause damage to our infrastructure.

In terms of resilience, in the event of natural disaster Council has Standby generators on trailers plus fixed installations that can be taken from site to site servicing the wastewater treatment plants and 18 wastewater pump stations as required.

Economic Activity trends

There are number of economic activity trends that have been recognised as having the potential to impose high and or seasonal demands on the infrastructure.

Long Term Renewals Programme and Funding:

The funding for the wastewater services renewal programme detailed in the financial section adequately services the SWDC wastewater services renewals for the period of this plan. There is a significant increase in the period 2030 to 2056, with the peak in 2050. There is a significant increase in the period 2030 to 2056, with the peak in 2050. It is mainly a reflection of the bulk of the reticulation assets that were installed in 1960-70s approaching the end of their 80-90-years lifecycle, which is also illustrated in Figure 6.1 and Figure 6.2,).

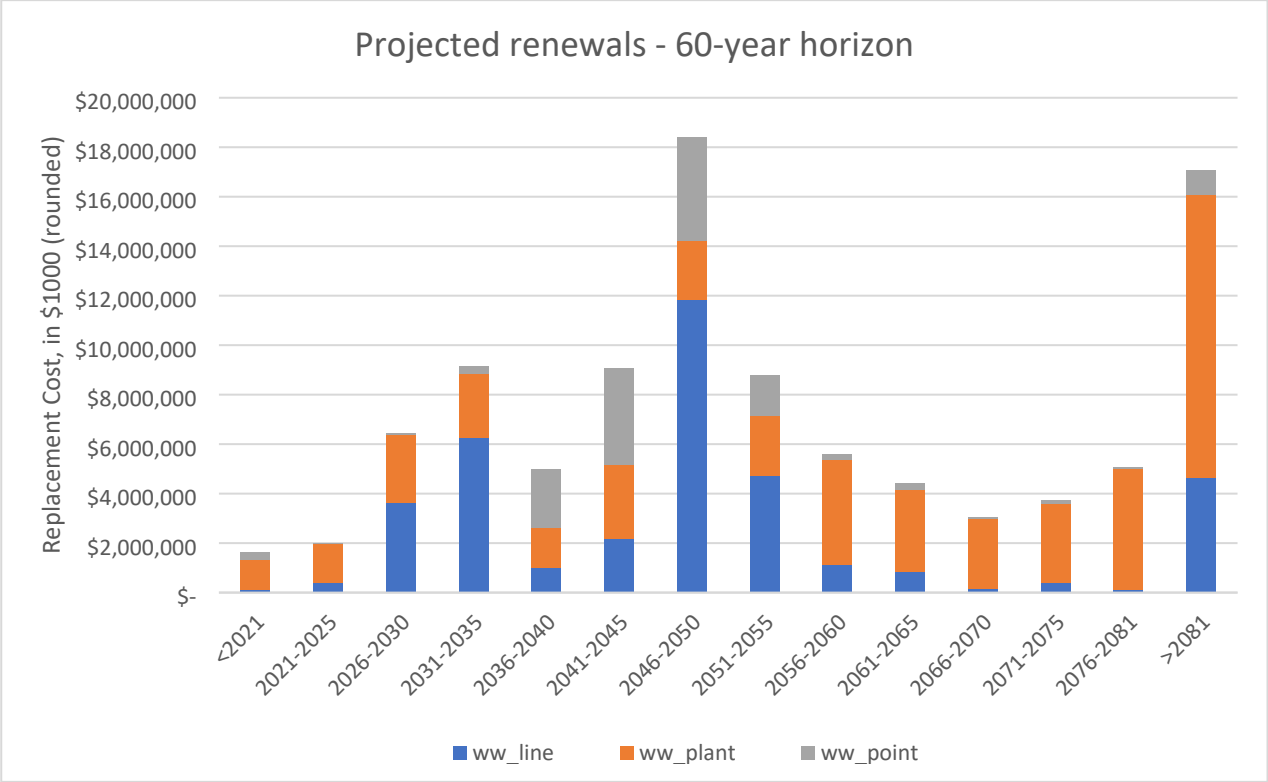


Figure 1.3 60 year all wastewater asset renewals (2020)

2 Strategic Planning Structure

2.1 The Strategic Plan and policy process

The strategic plan and process work as integrated whole to achieve the vision agreed by Council, this is represented in Figure 2.1 below. The top section of the pyramid (vision, community outcomes and strategy) describes what the public sees, and the bottom dark blue section describes the work carried by Council that forms the solid base to the public documents.

Figure 2.1 Strategic pyramid of Council

Source: http://www.southwaikato.govt.nz/our-council/strategies-plans-policies-bylaws/Pages/The-Strategic,-Plan-and-Policy-Process.aspx

2.2 Linkage to Long Term Plan

Over the years we prepared and adopted a number of strategies, policies and bylaws. As the Council strategy provides the overarching direction, every strategy, plan, policy, and bylaw that Council adopts should directly link to the Council strategy. At the core of our strategy is our vision, our outcomes, and our strategies. Figure 2.2 below shows how Council's documents fit together.

Figure 2.2 How Council's documents fit together

The goal of the Wastewater activity is to provide assets that facilitate the health and wellbeing of the community through appropriate collection, treatment, and disposal of wastewater. Linkage between the Council's Vision, Outcomes, related Strategies and Levels of Service applicable to the Waters Activity are shown in Figure 2.3 below.

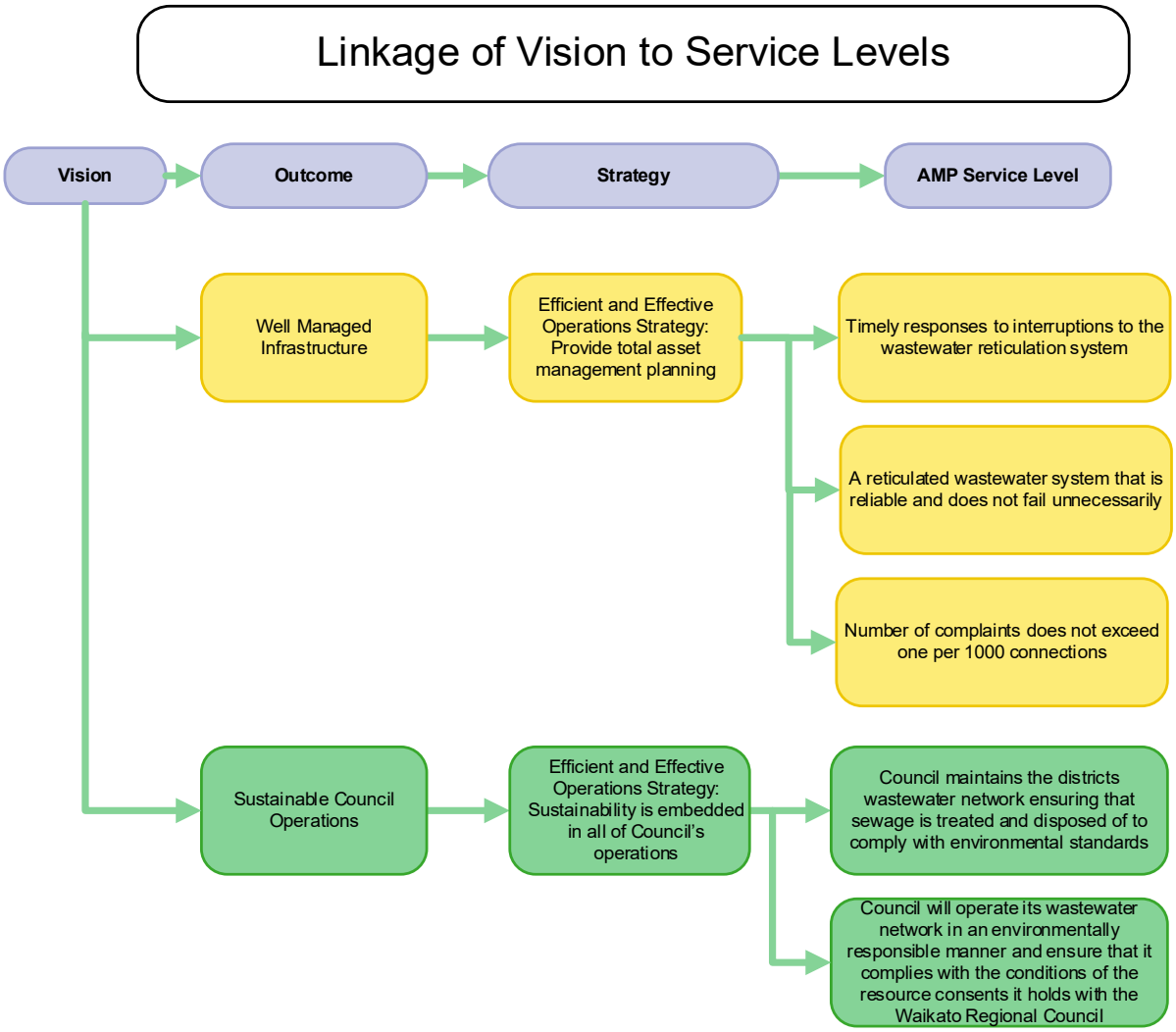


Figure 2.3 Linkage of Vision to Wastewater Service Levels

2.2.1 Wastewater Contribution

The Wastewater Activity contributes primarily to the following Council Outcomes and Strategies:

Table 2.1 Council Outcomes and Strategies

Outcomes	Strategies
Growth: Council aims to increase population and jobs, reduce unemployment, increase average earnings, and improve the deprivation index.	Infrastructure: It is imperative that our wastewater plant is fit for purpose in terms of a growing population and the associated demand.
Resilience: We all, Council and community, need to anticipate, resist, respond to and recover from significant change or events.	**Environmental resilience: In alignment with the proposed Healthy Rivers Plan changes, Council is obliged to undertake wastewater management that has reduced impact on waterways such as the Waikato River.**
Relationships: We will build stronger relationships with Iwi and Māori along with community and business groups to ensure that by working together we can achieve growth and a resilient community.	Engagement: Council and Raukawa have undergone a significant engagement process regarding options for the new wastewater plant.

2.2.2 Rationale

In urban residential areas, individual on-site wastewater treatment and disposal systems are neither economic nor technically feasible within the limited land areas available. They are potentially unsafe for humans and the environment, particularly if they are not properly maintained and operated. Collection and treatment of wastewater prior to disposal contributes to maintaining public health in urban areas where alternative means of disposal are neither attractive nor feasible.

The District draws its water supplies from ground and surface sources, there is potential for any source to become contaminated by effluent finding its way into aquifers, streams or rivers. This would degrade the quality of the District's plentiful natural water supply and waterways. Therefore, the Council provides and operates public collection and treatment systems in urban areas, to protect both the environment and community health.

The various forms of economic activity already existing within the District, or likely to come to the District, will need to dispose of wastewater and other classes of water-borne wastes in an acceptable manner. Having wastewater collection and treatment systems of sufficient capacity contributes directly to this objective.

Commercial and industrial premises generate particular contaminants that require proper treatment prior to disposal to the environment. The Trade Waste bylaw controls and regulates the types of contaminants and the volumes of wastewater that may be discharged to the community network and imposes appropriate charges for their collection and treatment. Controlling Trade Waste through a Bylaw ensures that the contribution of commercial consumers to the service will be known, controlled, monitored, and charged for at a rate that is fair and equitable for all those who pay for the service.

The discharge of human effluent to waterways has long been a recognised cultural concern to Māori with Raukawa being no exception. Council maintains modern wastewater reticulation and treatment systems and holds consents for these systems in accordance with current New Zealand law. Procurement of these consents required wide consultation and community involvement, including Raukawa and Pacific Island peoples. Council will continue to consult into the future as standards change, issues arise, and consents require renewal. This consultation will be appropriate to Māori and Pacific Island peoples and recognise their long-standing interest in the issues.

2.2.3 Levels of service

Council maintains about 170 km of sewer pipes and 18 pumping stations that make up the District's wastewater network, which each year carries approximately 1,477,308 cubic metres of wastewater to the Council's treatment plants, ensuring that sewage is treated and disposed of to comply with environmental standards.

Residents can expect timely responses to interruptions to the wastewater reticulation system.

Residents can expect a reticulated wastewater treatment system that is reliable and does not fail unnecessarily.

Council will operate its wastewater treatment systems in an environmentally responsible manner and ensure that it complies with the conditions of the resource consents it holds with the Waikato Regional Council.

2.2.4 Measures

1. How successfully the wastewater activity contributes to this objective will be measured by how effectively the service prevents any significant public health events that may be attributed to sewage contamination.

   Assurance of wastewater quality is measured by compliance with Resource Consents.

2. How successfully the wastewater activity contributes to this objective will be measured by how often there are capacity constraints on wastewater collection and treatment capacity and whether there is sufficient capacity to support growth in designated urban areas.

3. How successfully the wastewater activity contributes to this objective can be measured in the following ways:

   - By frequency of wastewater overflows from the collection network either through pipe blockages, breaks, or lack of capacity
   - By frequency of discharge of partially treated wastewater from treatment plants and pumping stations because of lack of capacity or through operational faults
   - By the compliance of each treatment plant with its resource consents. These consents are detailed in Appendix G
   - By monitoring the health of streams near treatment plant discharges for signs of pollution. Such testing is carried out regularly as part of the conditions of Councils' resource Consents which are listed in Appendix G

4. Raukawa, Māori will be included in any future consultation or consent renewal involving wastewater systems and treatment

2.2.5 Significant negative effects

There is the potential for the community to experience negative effects which are generated by the wastewater activity.

Table 2.2 Negative Effect mitigation for wastewater system

Potential Negative Effect	How it will be mitigated
Blockages, leakages and overflows cause harm to our environment.	The wastewater systems are routinely inspected, and Council conducts ongoing maintenance to ensure that the network is of an appropriate standard. Blockages and overflows are responded to as quickly as possible to minimise the impact on the environment.
There are significant financial costs (rate increases) associated with upgrading the wastewater treatment plants	Council is funding the upgrades through loans.
Blockages, leakages and overflows cause harm to our environment.	The wastewater systems are routinely inspected, and Council conducts ongoing maintenance to ensure that the network is of an appropriate standard. Blockages and overflows are responded to as quickly as possible to minimise the impact on the environment.
Competing values and priorities can create tension between Council and stakeholders. Treaty partnerships are important and a legislative requirement	Relationships with iwi are a key priority for Council. Councillors and staff will endeavour to maintain successful co-management and co-governance partnerships with iwi.

2.2.6 Justifying Council Involvement and Ownership

Council's current ownership role stems from legacy ownership that, except in particular circumstances, is now prohibited from passing to private ownership by the Local Government Act 2002, Section 130 to 137.

Section 130 of the LGA 2002 prohibits a council from “divesting its ownership or other interest in a water service” (except in very specific circumstances described in further Sections of the Act). Section 124 includes wastewater assets within the definition of water services. Therefore, Council has a statutory obligation to continue owning all wastewater assets owned by Council.

Council has had a legacy involvement in the ownership and operation of the wastewater assets and activity which has been necessary to fulfil its duties under the provisions of the Health Act 1956 and more recently the Building Act 2004.

Through consultation with the community, this activity has been shown to make an essential contribution to the well-being of the community in areas of public health, environment, and the local economy.

Council believes that, because of the natural monopoly and “public good” nature of the service, it should retain ownership and continued operation of the wastewater assets.

3 State of the Assets (what assets we have)

3.1 Network Overview

The following section summarises the assets, discussing the strategies and tactical plans for each asset group. Figure 3.1 below details the replacement costs of the four community wastewater networks.

Council's reticulated wastewater collection, treatment and disposal systems serve the four urban areas of Tokoroa, Putāruru, Tirau and Arapuni. These four physically separate systems collectively comprise 167km of reticulation pipelines, 18 pump stations, 3,209 manholes, and 4 treatment plants. The oldest recorded components are dated 1935. Key components include:

- Service connections. Depending on the age of the property these pipes may be either glazed earthenware or PVC. This pipe is generally the property owners' responsibility, and Councils' maintenance responsibility would typically end at the property boundary. In many areas there are more than one household connected to some connections which blur the responsibility for matters such as blockages and tree roots
- Wastewater gravity reticulation pipes typically between 150 mm and 300 mm in diameter depending on location made of asbestos cement, concrete, steel-lined concrete, uPVC, or glazed earthenware. This collection network includes manholes where changes in grade or direction occur
- Pumping stations where the lowest part of a catchment area is below the gravity reticulation grade
- Treatment plants. There is a single treatment plant in each of the reticulated areas. The largest and most sophisticated of these plants is at Tokoroa, and includes pre, primary, secondary, tertiary, and sludge treatment. The Putāruru plant includes primary, secondary, and some sludge treatment, Tirau is a modern membrane filtration (MBR) plant. The Arapuni plant includes only primary treatment, filtration (without disinfection) and sludge treatment. A common theme throughout this AMP is Councils' expectation that Waikato Regional Council will impose higher standards requiring increasingly sophisticated treatment processes
- Discharge points into the adjacent watercourse which are respectively the Whakauru Stream for Tokoroa, the Oraka Stream for Putāruru and for Tirau, and into the ground at Arapuni. Each of these discharges is subject to comprehensive resource consents which are listed in Appendix G of this AMP

The wastewater assets include

- Reticulation pipe work.
- Manholes and inspection points for access into the wastewater network.
- Wastewater pump stations.
- Electrical controls to monitor the pumping systems.
- Rising mains from pump stations.
- Wastewater Treatment Plants.
- Discharge structures.

The Council owns and manages four separate wastewater systems in the urban areas, using its professional engineering staff and external resources where required. The wastewater assets in the urban areas are as follows:

Table 3.1 Wastewater assets by community

Asset Component	Tokoroa	Putāruru	Tirau	Arapuni	Total
Reticulation, km	118.9	36.9	9.2	4.1	169.2
Manholes (reticulation network)	2,266	689	167	87	3,209
Inspection points	0	0	4	0	4
Pump stations	9	6	3	0	18
Electrical controls	30	29	27	3	89
Rising mains, km	4.1	2.0	1.0	0.4	7.6
Treatment plants	1	1	1	1	4
Discharge (Outlet) structures	1	1	4	0	6

The total renewal cost of the existing wastewater assets is $72 million as at the 2019 asset valuation, as shown below.

There has been increase in Replacement Cost (based on the AssetFinda data effective 04 Aug 2021) since the 2019 valuation, largely due the new Anaerobic Digester and associated equipment at the Tokoroa Wastewater Treatment Plant.

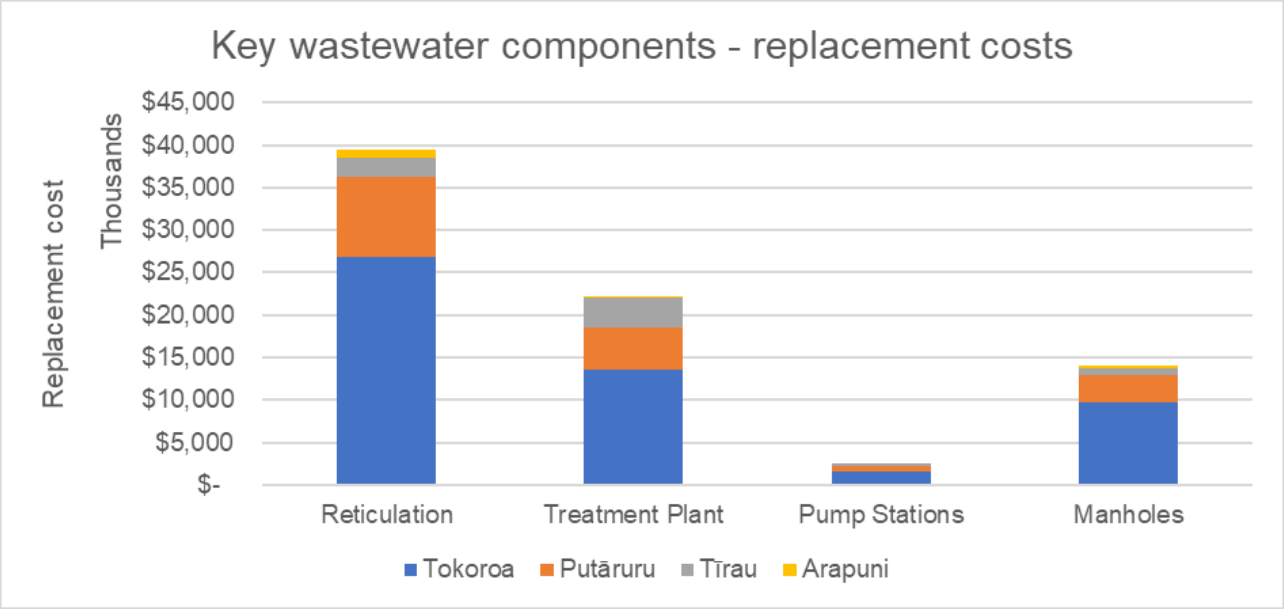


Figure 3.1 Wastewater replacement costs by community

The reticulation component of Council's Wastewater activity is characterised by the large length of pipes installed in Tokoroa over the period 1960 to 1975 which may give rise to a significant "bow wave" of renewals as they reach the end of their economic lives. The bulk of these pipes are 150 mm diameter asbestos cement, with some concrete and concrete-lined steel pipes used for larger trunk mains.

3.2 Sub-Networks Overview, Condition and Value

The following section summarises the assets, their condition and value, as well as strategies and tactical plans for each of the four community wastewater subnetworks that serve the four urban areas of Tokoroa, Putāruru, Tirau, and Arapuni. It is noted that most Renewals are for Tokoroa 2031-35 and 2051-55, followed by Putāruru in 2046-50, and Tirau in 2046-50.

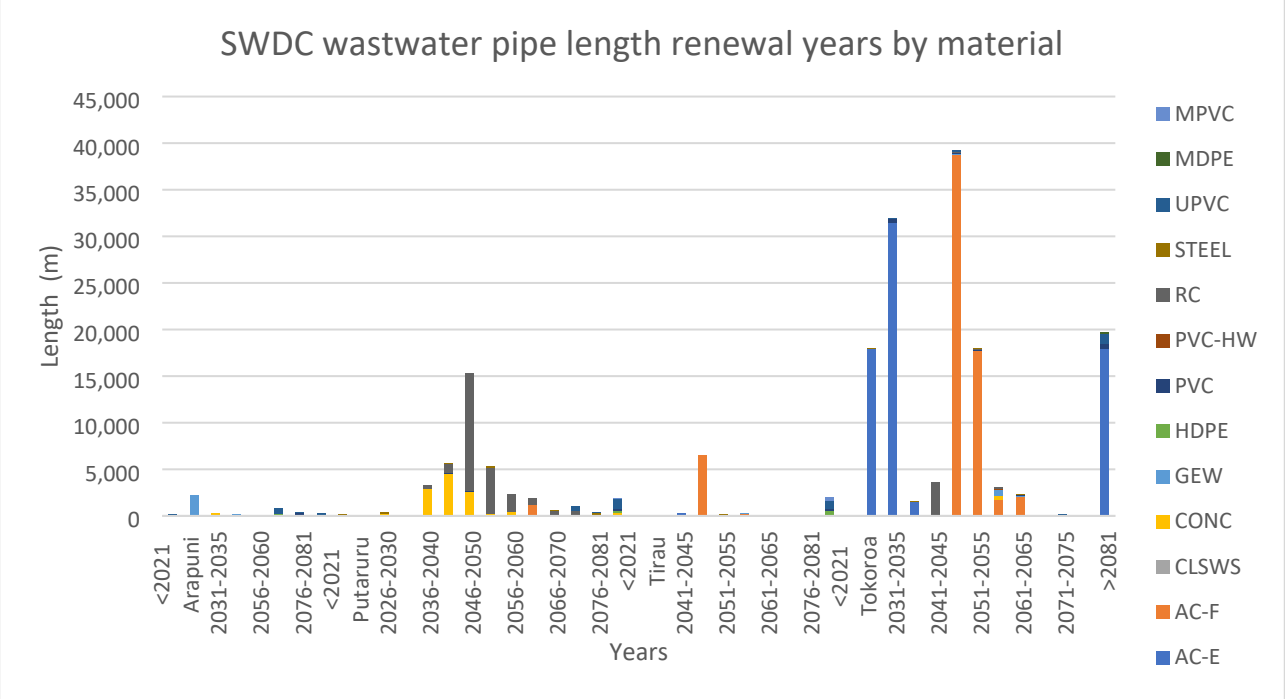


Figure 3.2 Wastewater pipe length renewal years by material

3.2.1 Tokoroa

General Overview

Tokoroa's reticulation was marked by the rapid expansion of the town from 1960 through to about 1975 when the population peaked at 19,800. Recent extensions have been completed for industrial developments in Satco Drive, Anchor Lane, and Huttloc Drive. The current length of public sewers stands at 117.7 km.

The majority of pipelines in Tokoroa are made from asbestos-cement material. Earlier installations up to about 1960 are thought to be mainly "Everite", although there could have been other imported makes installed. There are no records of purchases from this period to identify the manufacturer conclusively and it is virtually impossible to identify the different makes from samples taken from in-situ pipes.

Pipes installed from about 1960 onwards were "Fibrolite", "AC" or "Supertite" steam cured asbestos cement pipes made in New Zealand by James Hardie & Co Ltd. Some concrete and concrete-lined steel pipes were also used in larger trunk mains.

Since these materials were phased out in the late 1980s all subsequent reticulation has used uPVC and mPVC rubber ring jointed pipe.

Table 3.2 Tokoroa Scheme Overview

System Information		Comments
Population	14,498	NZ Statistics, 2019
Properties Connected	5,394	Eff. June 2020
Pump Stations	9	
Treatment Plants	1	
Manholes	2,266	
Reticulation - Length of Mains	119 km	
Replacement Cost - Total Scheme	$15,092,377	Eff. 19 Mar 2019
Average daily flow	4,177 m^3	Jun-2019 to May-2020

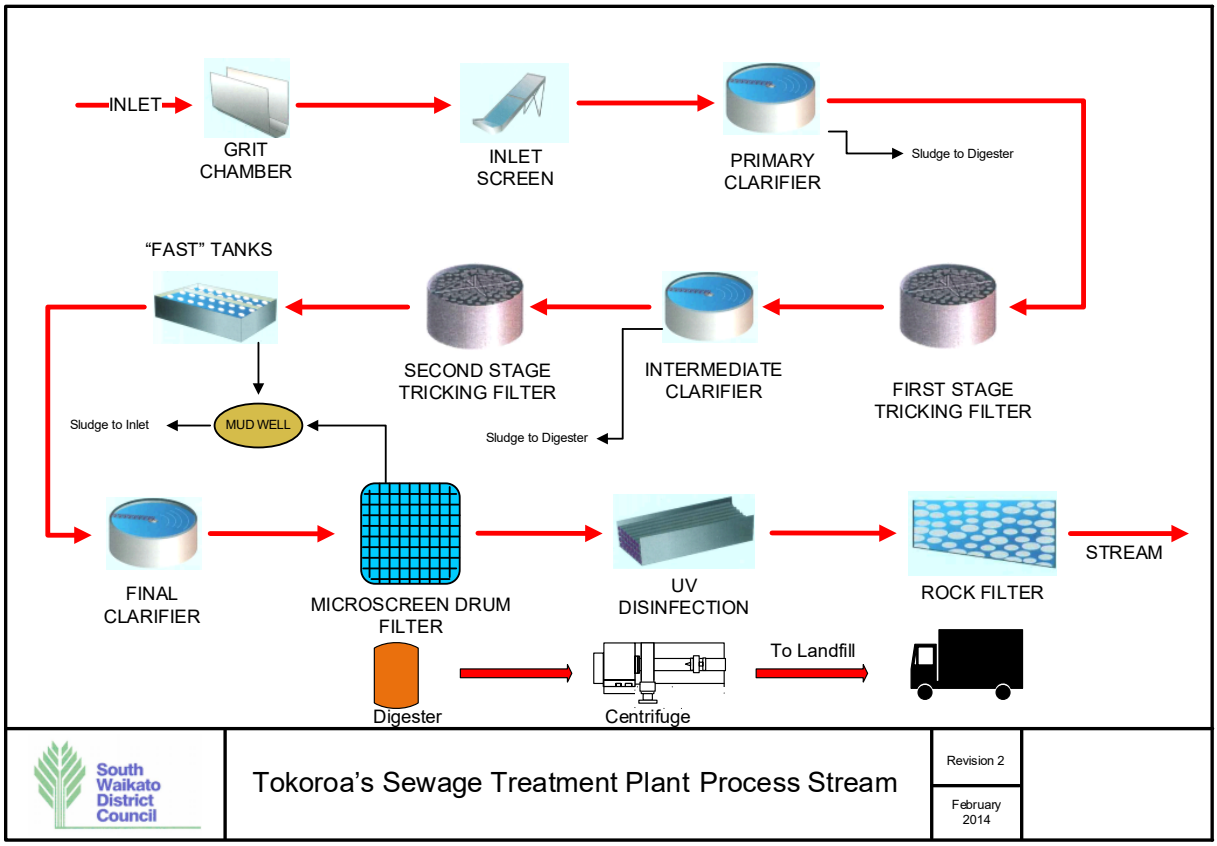


Figure 3.3 Tokoroa Treatment Process Diagram

Tokoroa Treatment Plant

The original treatment plant was constructed in 1958 and major upgrades occurred in 1967, 1982, 1993, and in 1997 when the tertiary stage was added.

Pre-Treatment

The wastewater flows into a grit removal channel where the heavy grit (sand, silt, pebbles, etc.) sink. To ensure maintenance and operational problems within the plant are minimised, the wastewater is then coarse screened to remove rags, wood, plastic, and other large items (as diverse as tennis balls, pyjamas, and false teeth). This is followed by a finer Bandscreen, which removes smaller debris before the wastewater enters

the works. The grit and screened material are fed into large waste bins and responsibly disposed of in a sanitary landfill. Tankered wastes including septic tanks and industrial wastes are now received in a purpose-built facility where they are screened separately before being fed in a controlled way to the head of the plant.

Primary Treatment

Primary treatment involves the settlement of organic solids. The wastewater enters a settlement tank (primary clarifier) where the organic solids slowly settle. The settled solids form a layer of sludge at the bottom of the tank, which is removed and further treated before disposal, while the liquid fraction goes to secondary treatment for further processing.

Secondary Treatment

The clarified wastewater receives secondary biological treatment. The same bacteria that naturally biodegrade wastewater in rivers and streams are used in biological treatment systems, by intensifying this natural process. At Tokoroa this process is carried out by biological trickling filters. Micro-organisms use the dissolved organic matter in the wastewater as their food source and remove these pollutants from the wastewater.

The two trickling filters are full of rocks which provide a surface (or “media”) for the attachment and growth of the purifying micro-organisms. The micro-organisms form a microbial film over the media and the dissolved organic material is digested as the wastewater flows over this film.

Solid waste from this process settles out in a secondary settlement tank, similar to that in the primary treatment phase. The wastewater quality is significantly improved by this stage, but the level of nutrients, suspended solids and pathogens needs to be reduced further. This occurs during tertiary treatment.

Tertiary Treatment

This stage of treatment is designed to “polish” the treated wastewater, or effluent, to a high quality before it is discharged. It consists of three treatment processes in series.

The first part of tertiary treatment is the “FAST” (Fast Activated Sludge Treatment) biological process which consists of two tanks filled with special plastic media to which micro-organisms attach themselves and grow. The effluent does not flow over the surface, as in the trickling filters, but actually fills the tanks and submerges the media. Air is injected into the tanks to provide the oxygen needed by the micro-organisms.

The micro-organisms in this treatment process break down the remaining fraction of dissolved organic matter to a very low level and also convert ammonia in the effluent to nitrate, a non-toxic form of nitrogen.

After the effluent passes through the FAST system it is further treated in an MBBR (Moving Bed Bio Reactor) plant, this involves small floating media which encourages the growth of bacteria, additional Ethanol/Methanol is added to encourage the conversion of dissolved nitrogen into N2 gas, which is released into the atmosphere, this is an anoxic reaction where oxygen supply is limited.

After the denitrifying MBBR process the effluent passes through the final clarifier and then through a drum filter. As the effluent flows through the drum filter, small suspended solids are removed. The solids become trapped in the filter and are removed by periodic washing of the filters. The wash water is pumped to the primary settlement tanks where the solids are removed.

After this extensive treatment the effluent is discharged via rock filters into the Whakauru Stream. The quality of the effluent entering the stream is of a very high standard allowing greater recreational use and ensuring fish such as trout can live just below the discharge outfall.[6]

Sludge Treatment

The primary sludge and solids from the secondary and tertiary biological treatment processes are treated in a digestion tank. The temperature in the tank is maintained at 35-36^{o}C and here the sludge undergoes a complex biological process which kills disease producing micro-organisms and removes odour and reduces the final volume of sludge produced.

[6] It is intended to construct a wetland in 2022/23 which will replace the existing rock outfall

The process produces a stable end product which is treated with a coagulant and thickened in a centrifuge before being taken to the MyNoke vermicomposting plant. Putāruru, Tīrau and Arapuni sludge is also processed in the Tokoroa plant. The digestion plant produces methane gas which is used as an energy source to provide heating of the digester the biogas is held in in an inflatable tank and is supplemented with natural gas as necessary.

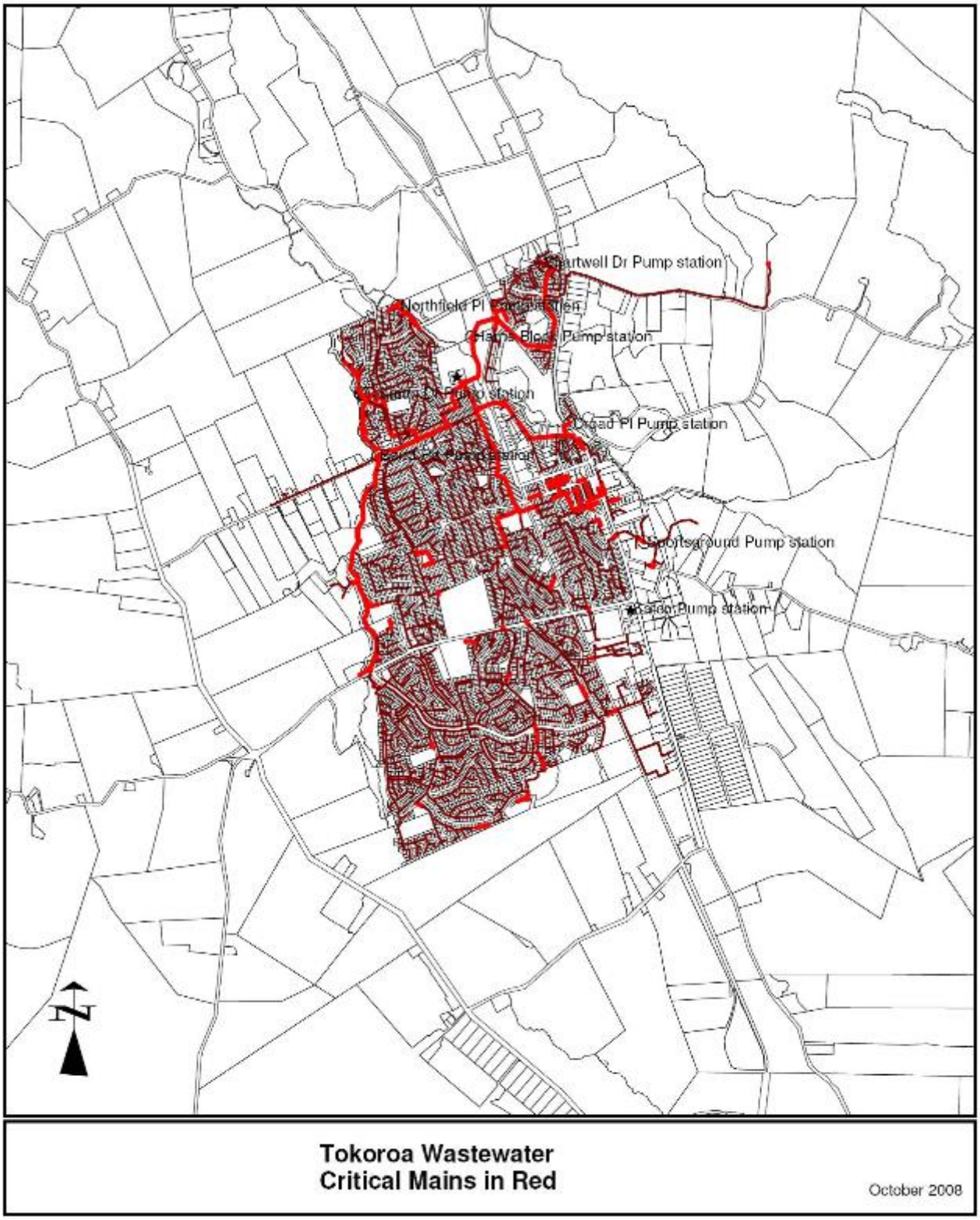


Figure 3.4 Tokoroa Wastewater Critical Assets

Tokoroa Asset Details

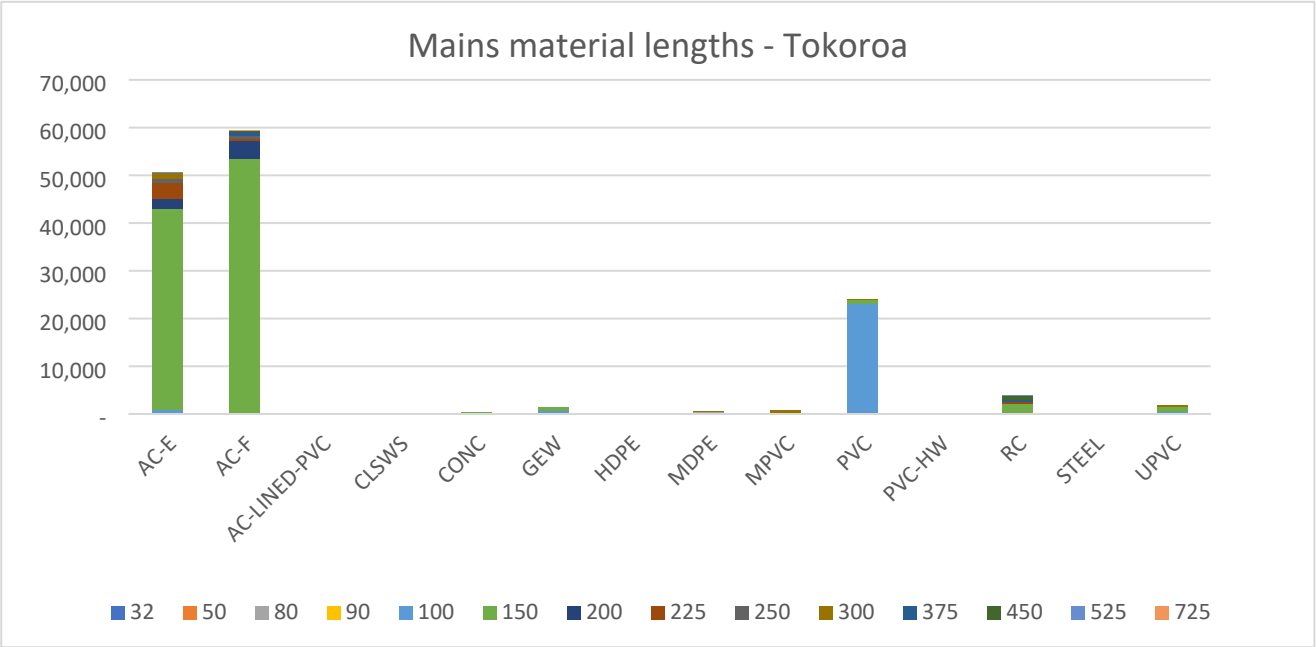


Figure 3.5 Tokoroa Mains Lengths by Material

A large portion of Tokoroa was built in the 1950's and 1960's, which is why the sewer pipes in the town are predominantly AC pipes. It is expected from 2030 to 2060 there will be a requirement to replace a large number of pipes.

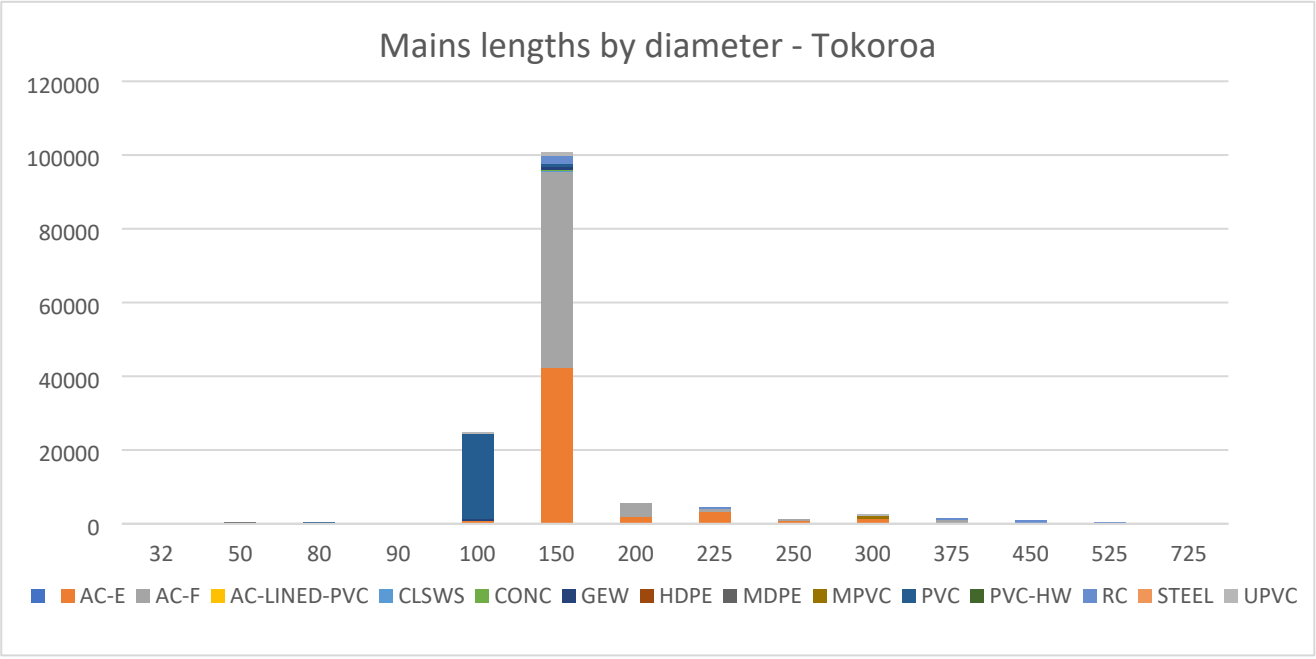


Figure 3.6 Tokoroa Mains Diameter Range

The majority of growth in the sewer network took place between 1950 and 1980.

The majority of sewer mains in Tokoroa are 150 mm.

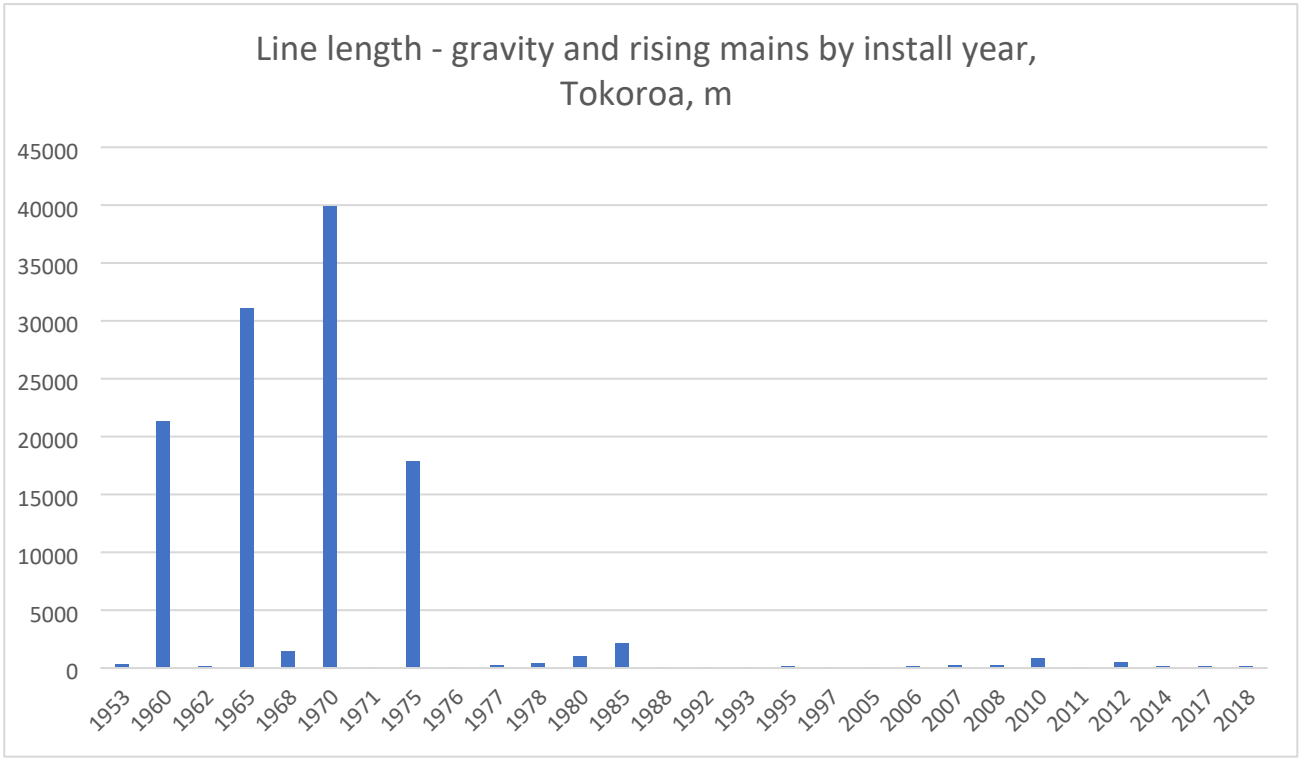


Figure 3.7 Tokoroa Mains Install Year

Table 3.3 Tokoroa Reticulation Mains - Forecast Renewal Needs Date (metres)

Renewal Year	AC-E	AC-F	CLSWS	CONC	GEW	PVC	PVC-HW	RC	STEEL	UPVC	MDPE	Total, 5-year
2020-2024	-	-	-	-	-	-	-	-	-	24	-	24
2030-2034	17,774	-	-	-	-	-	258	-	-	-	24	18,056
2035-2039	32,430	-	-	-	-	-	-	-	-	37	-	32,467
2040-2044	-	-	-	-	-	-	2	-	-	-	-	2
2045-2049	-	-	-	-	-	-	-	-	3,646	24	-	3,670
2050-2054	-	38,556	74	-	5	-	180	-	55	-	197	39,067
2055-2059	-	17,815	-	-	-	-	92	-	167	-	-	18,074
2060-2064	-	1,011	-	343	746	-	-	80	134	37	-	2,351
2065-2069	-	2,008	-	-	77	-	91	-	-	-	39	2,215
2070-2074	-	-	-	-	-	-	-	-	-	24	87	111
2075-2080	-	-	-	-	-	-	-	-	-	-	140	140
Total	**50,204**	**59,390**	**74**	**343**	**828**	**-**	**623**	**80**	**4,002**	**146**	**487**	**116,177**

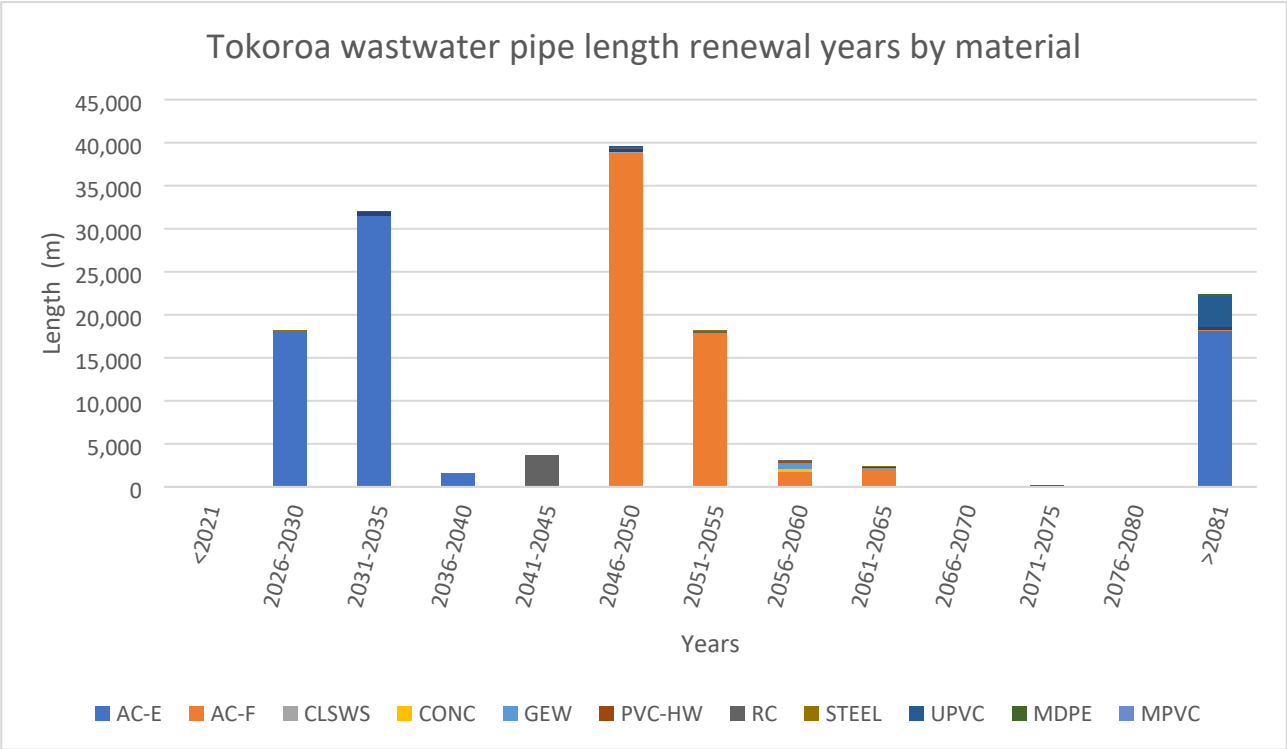


Figure 3.8 Tokoroa Reticulated Mains - Forecast Renewal Date

Table 3.4 Tokoroa Assets Renewals Needs by Asset Type - Forecast Life

Renewal years	LINE	PLANT	POINT	Total, 5-year interval
<2021	$4,380	$1,948,570	$870	$1,953,821
2021-2025	-	$2,185,793	-	$2,185,793
2026-2030	$3,570,668	$2,491,466	-	$6,062,134
2031-2035	$6,210,502	$2,423,816	-	$8,634,318
2036-2040	$347,309	$1,370,185	$1,871,823	$3,589,316
2041-2045	$914,454	$2,773,863	$2,645,425	$6,333,742
2046-2050	$7,618,816	$2,502,907	$3,433,012	$13,554,736
2051-2055	$3,709,555	$2,215,289	$1,390,617	$7,315,461
2056-2060	$609,861	$4,253,049	$108,000	$4,970,911
2061-2065	$463,388	$1,930,544	$162,517	$2,556,450
2066-2070	$7,453	$2,382,521	$9,798	$2,399,772
2071-2075	$37,529	$3,794,769	$29,575	$3,861,873
2076-2080	$8,330	$3,445,736	-	$3,454,066
>2081	$352,901	$2,657,860	$219,562	$3,230,322
Totals	**$27,741,318**	**$45,611,463**	**$9,913,334**	**$83,266,114**

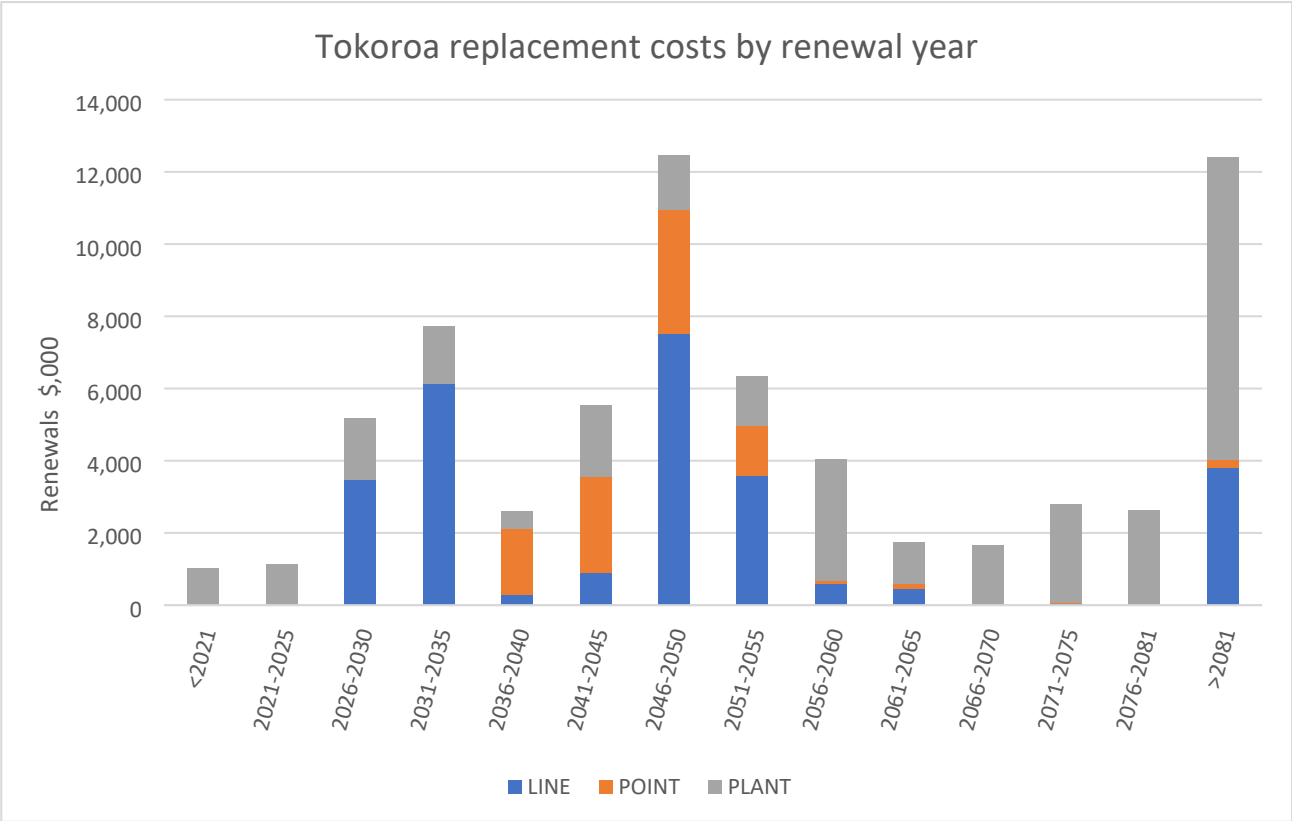


Figure 3.9 Tokoroa Assets Renewals Needs by Asset

As plant assets generally have a shorter life, there is a more even distribution of replacement required, until the 2060' and 2070's, when some of the large long-life items come up for renewal.

Pump Stations

The schedule of pump stations below gives the date of installation and the number of pumps in each.

Table 3.5 Tokoroa Pump Stations

Pump stations	Pump install dates	Make	Model	Quantity
Baird Rd Pump station	Jun-13	ABS	XFP150G-CB1	3
Chartwell Dr Pump station	Jun-07	ABS	AFP M30/4D	1
	Jun-20	Sulzer/ABS	06-750-66-1	1
Croad Pl Pump station	Mar-16	Flygt	ND3085	2
Harris Block Pump station	Sep-01	Flygt	NP3127	2
Northfield Pl Pump station	Jun-04	Flygt	CP3102	2
Satco Pump station	Jan-87	Tsurumi	100C437	1
Sportsground Pump station	Jun-10	Flygt	NP3085MT463	1
Tasman Dr Pump station	Jun-08	ABS	AFP1045	2

Growth

Future growth in Tokoroa has been estimated as a per annum growth rate of 0.3%, with no specific growth areas or new developments were identified at the time of modelling. Applying a uniform growth rate will provide an indication of areas where development could be more readily serviced by the water infrastructure.

Upgrade Options

No upgrades of the water supply network have been identified.

3.2.2 Putāruru

General Overview

Wastewater reticulation of Putāruru commenced about 1955 with the majority of the reticulation being completed by 1967. Sewers were extended in the early 1990s to Bridge St., and there have been further extensions recently in Taupo St., Matai Cr, and Cambridge St. The total length of public sewers is now 37 km.

Early wastewater reticulation in Putāruru used rubber-ring jointed concrete pipes and glazed earthenware pipes for smaller diameter (less than 100 mm) house connections. As in Tokoroa, installations from the late 1960's to the early 1980's were predominantly a mix of asbestos-cement and latterly uPVC.

Table 3.6 Putāruru Scheme Overview

System Information		Comments
Population	6,687	NZ Statistics, 2019
Properties Connected	1,760	Eff. June 2020
Pump Stations	6	
Treatment Plants	1	
Manholes	689	
Reticulation - Length of Mains	37 km	
Replacement Cost - Total Scheme	$5,708,979	Eff. 19 Mar 2019
Average Daily Flow	1,129 m^3	Jun-2019 to May-2020

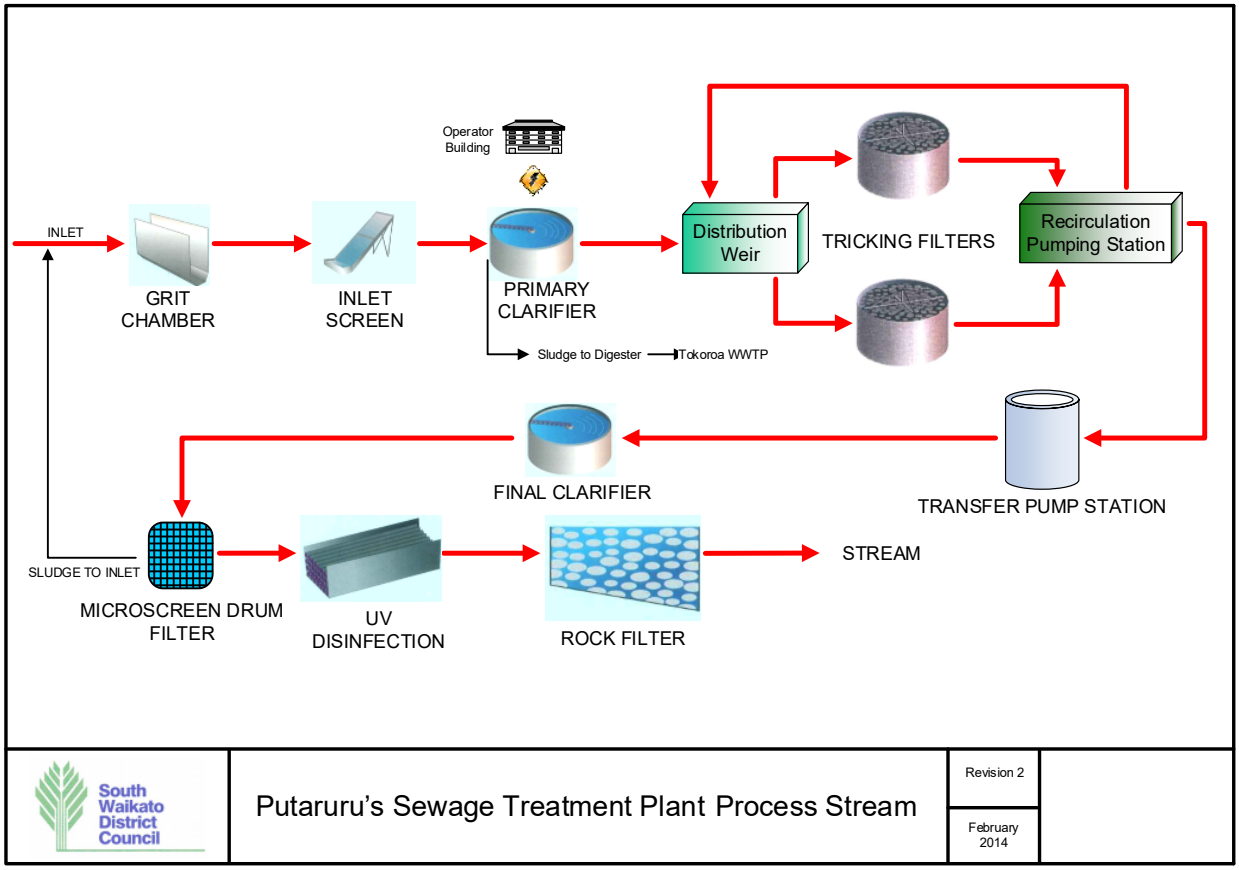


Figure 3.10 Putāruru Wastewater Schematic

Putāruru Treatment Plant

This plant was originally commissioned in 1957, upgraded in 1965, and again in 2001. It comprises a grit trough for removing coarse stones and grit, then an inlet "stepscreen", followed by primary clarification, two biological filters operated in parallel, a final clarifier and a two-stage sludge digestion. The clarified effluent is then passed through a fine microscreen filter, then UV disinfection before discharge to the Oraka Stream through a rock outfall. The operation of this plant is similar to that described for the primary and secondary stages in the Tokoroa plant but at a smaller scale.

An operator building houses the plant's electrical controls. There is also a boiler house which was once used to heat the main digester. It is no longer used but could be re-commissioned if the need arose.

The majority of the plant is constructed of reinforced concrete and steel with some concrete block and timber buildings.

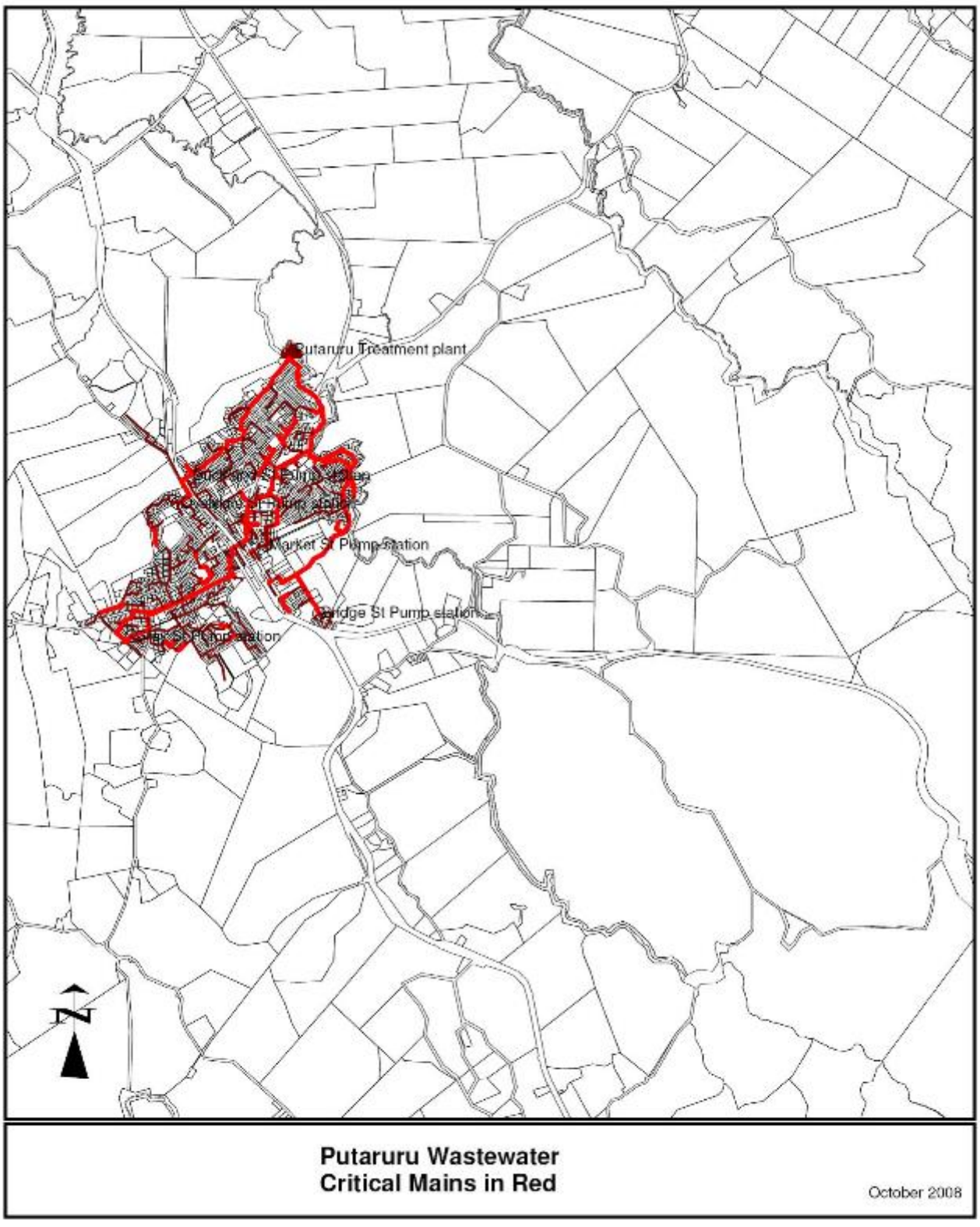


Figure 3.11 Putāruru Wastewater Critical Assets

Putāruru Asset Details

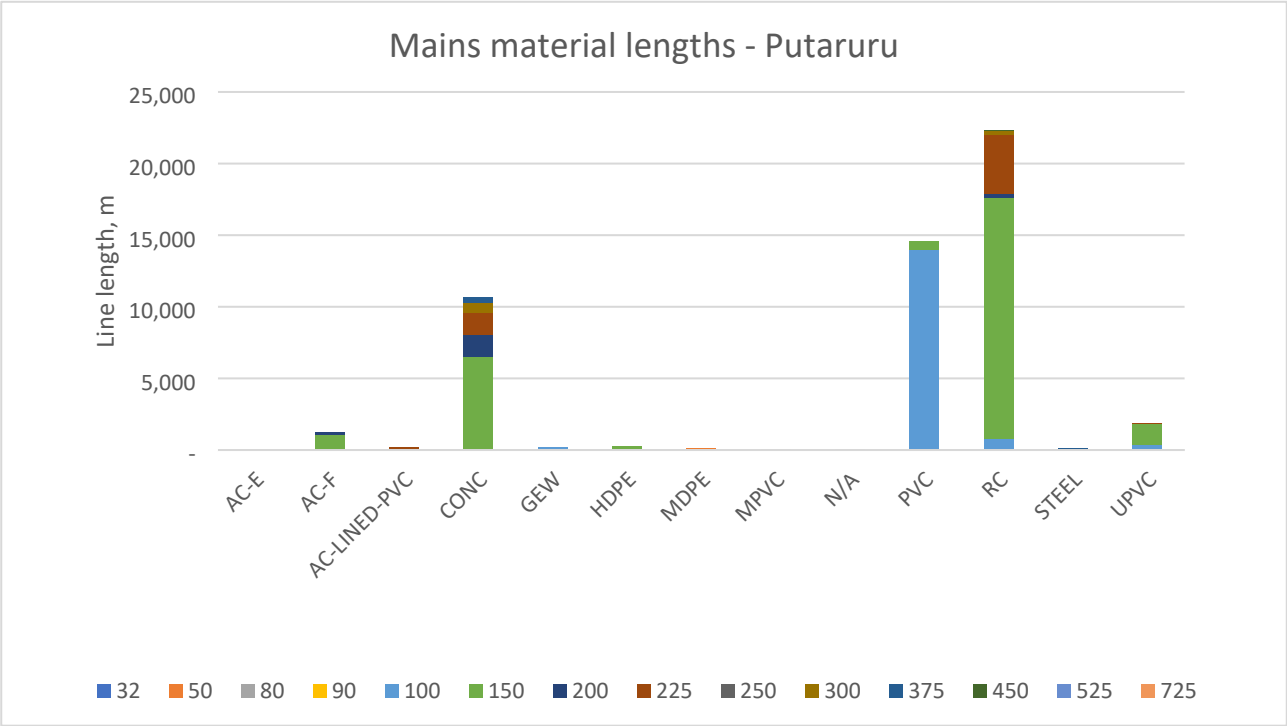


Figure 3.12 Putāruru Mains Lengths By Material

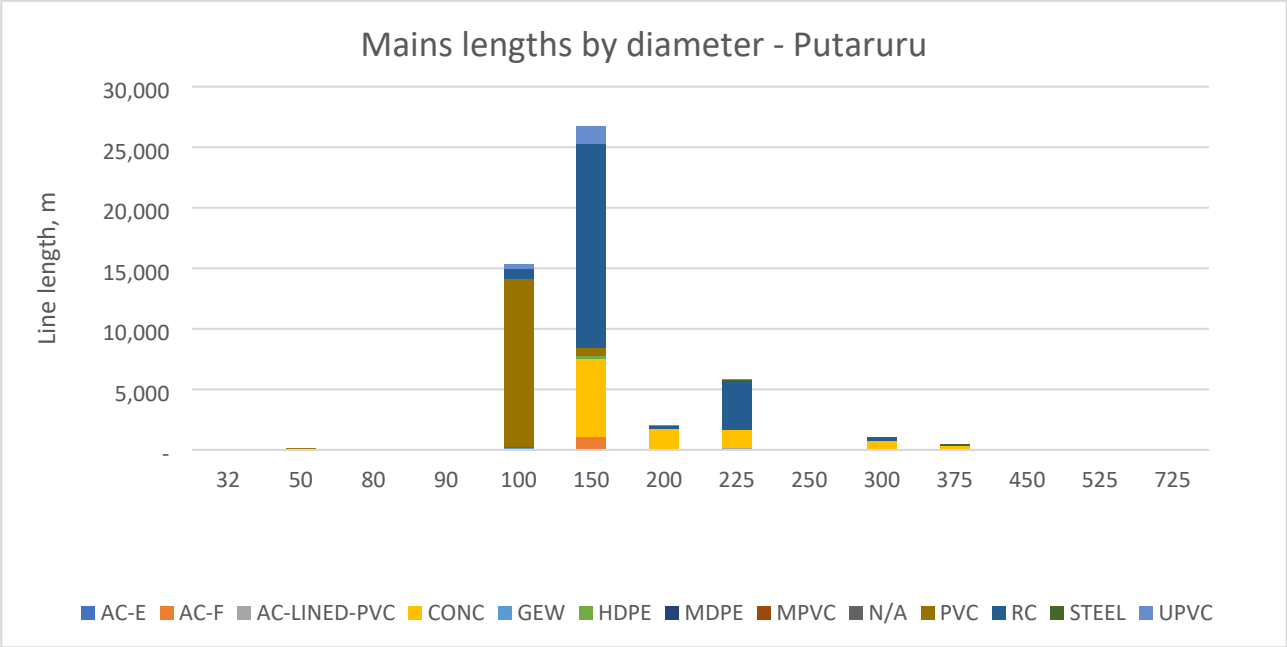


Figure 3.13 Putāruru Mains Diameter Range

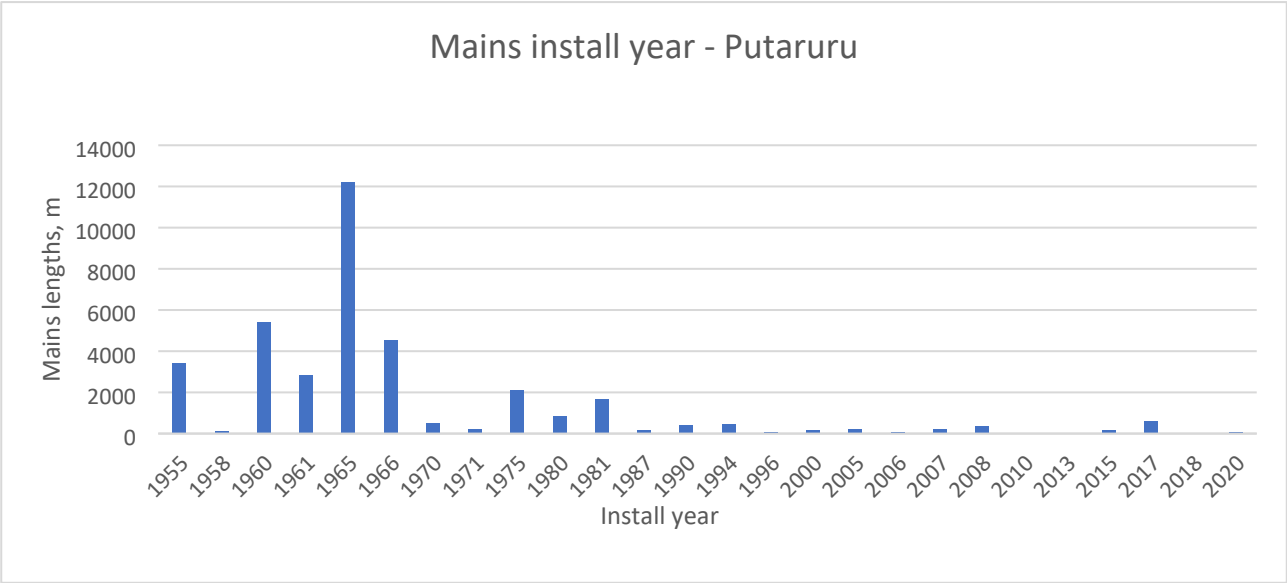


Figure 3.14 Putāruru Mains Install Year

Table 3.7 Putāruru Reticulation Mains - Forecast Renewal Date (metres)

	AC-E	AC-F	CLSWS	CONC	GEW	HDPE	PVC	PVC-HW	RC	STEEL	UPVC	MDPE	MPVC	Grand Total
<2021	-	-	-	-	-	-	-	-	-	130	-	-	-	**130**
2021-2025	-	-	-	127	-	-	-	-	-	-	-	-	-	**127**
2026-2030	-	-	-	220	-	-	-	-	-	130	-	-	-	**350**
2031-2035	-	-	-	90	-	-	-	-	-	-	-	-	-	**90**
2036-2040	-	-	-	3,075	-	-	55	-	427	-	-	-	-	**3,557**
2041-2045	-	-	-	4,516	-	-	85	-	1,048	4	-	-	-	**5,653**
2046-2050	28	-	-	2,549	-	-	124	-	12,968	-	-	-	-	**15,669**
2051-2055	-	81	-	189	-	-	-	-	4,932	130	-	-	-	**5,332**
2056-2060	-	-	-	410	-	-	-	-	1,898	-	-	-	-	**2,308**
2061-2065	-	1,125	-	100	-	-	-	-	731	-	-	-	-	**1,956**
2066-2070	-	-	-	-	-	-	-	-	568	4	-	-	-	**572**
2071-2075	-	-	-	84	-	-	-	-	480	-	474	-	-	**1,038**
2076-2080	-	-	-	-	-	-	143	-	-	130	84	-	-	**357**
>2081	-	-	-	347	-	270	302	-	17	4	966	-	18	**1,924**
Grand Total	**28**	**1,206**	**-**	**11,707**	**-**	**270**	**709**	**-**	**23,069**	**532**	**1,524**	**-**	**18**	**39,063**

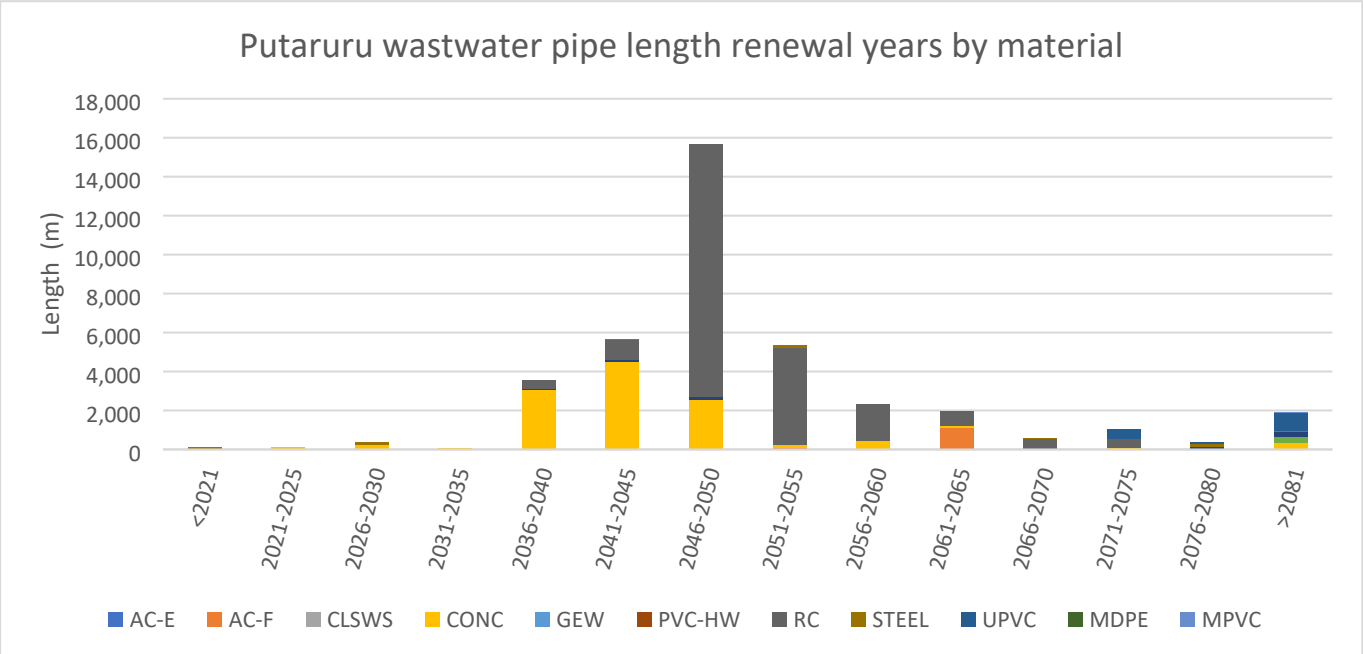


Figure 3.15 Putāruru Reticulated Mains - Forecast Renewal Needs Date

Table 3.8 Putāruru Assets Renewals by asset type - Forecast Life

Renewal Year	Line	Point	Plant	Grand Total
<2021	$43,502	-	$328,573	$372,075
2021-2025	$28,048	-	$432,130	$460,178
2026-2030	$102,022	-	$763,675	$865,698
2031-2035	$19,770	$328,614	$925,553	$1,273,937
2036-2040	$734,922	$517,049	$1,105,076	$2,357,047
2041-2045	$1,216,089	$1,279,662	$425,379	$2,921,130
2046-2050	$3,104,722	$282,325	$457,699	$3,844,746
2051-2055	$1,024,322	$213,625	$1,090,426	$2,328,373
2056-2060	$429,136	$67,775	$848,948	$1,345,859
2061-2065	$377,508	$97,175	$2,303,043	$2,777,726
2066-2070	$125,791	$49,775	$530,687	$706,253
2071-2075	$199,027	$55,071	$593,376	$847,474
2076-2080	$82,591	$22,514	$912,154	$1,017,259
>2081	$394,030	$203,649	$2,373,152	$2,970,831
Grand Total	$7,881,481	$3,117,234	$13,089,872	$24,088,587

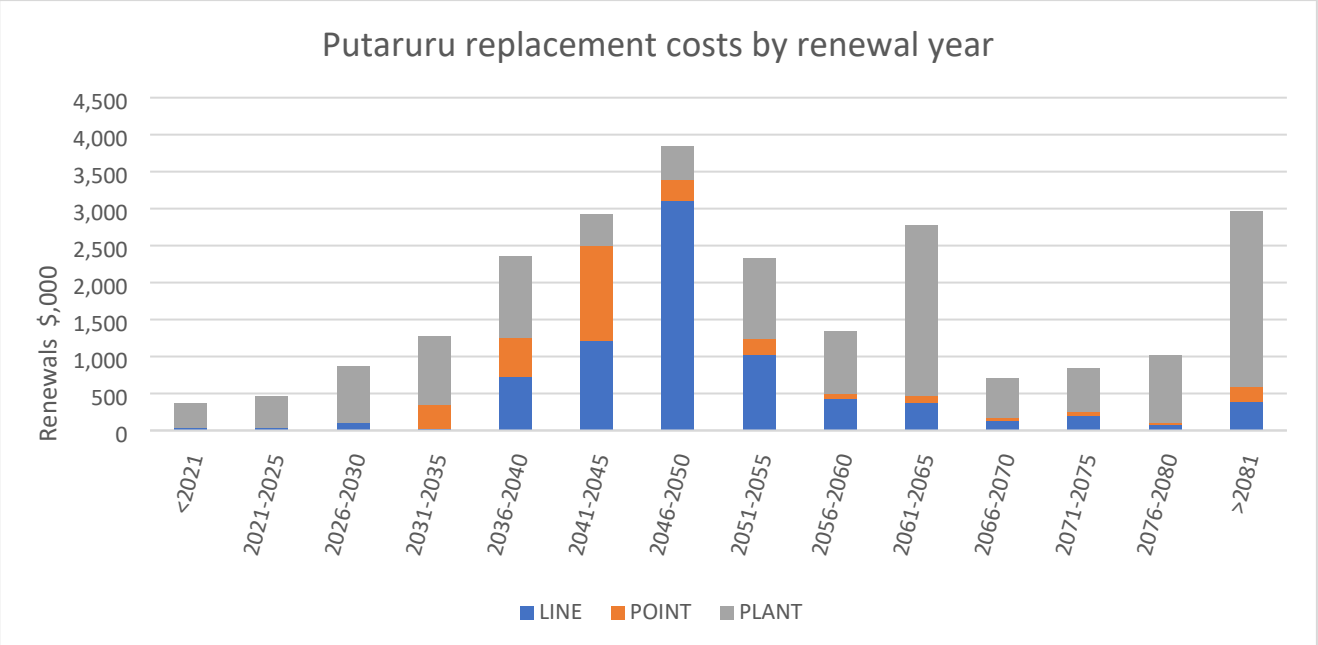


Figure 3.16 Putāruru Assets Renewals Needs by Asset Type Data

The plant items have a steady replacement program as they have shorter, different lives depending on the plant item. The increases in expenditure in 2060 to 2070 reflects replacement of the larger longer life items such as clarifiers etc.

Pump Stations

The schedule of pump stations below gives the date of installation and the number of pumps in each.

Table 3.9 Putāruru pump stations

Pump stations	Pump install dates	Make	Model	Quantity
Bridge St Pump station	Jan-96	Flygt	CP3127HT	2
Buckland St Pump Station	Apr-12	ABS	XFP81E	1
	Apr-20	Sulzer/ABS	XFP81E	1
Galway Pump station	Jan-98	ABS	M14-40	1
	Dec-09	Flygt	NP3085	1
Grey St Pump station	Jan-97	Pumpex	K106	2
Market St Pump station	Sep-18	Grundfos	950471100000126	1
	Jun-20		950474100000132	1
Overdale St Pump station	Apr-16	ABS	XFP81E-VX-PE70/2-DO5X10	1
	Apr-16		XFP81E-VX-PE70/2-DOSX20	1

3.2.3 Tīrau

General Overview

Most of Tīrau town was reticulated in the early 1970's with later extensions in Frances/Jordan, Hillcrest/Oxford, then Patetere St in later years. Further developments were completed during 2008 in Parapara Road. The total length of public sewers is now 9 km.

All the initial reticulation of Tīrau used Fibrolite pipe for the public sewers and glazed earthenware for house connections. As in other towns, there are a number of shared house connections with no clear responsibility for maintenance between property owners. These situations are covered by the Councils Private WW Drain Policy ECM184080.

Table 3.10 Tīrau Scheme Overview

System Information		Comments
Population	700	Estimate
Properties Connected	401	Eff. June 2020
Pump Stations	3	
Treatment Plants	1	
Manholes	167	
Reticulation - Length of Mains	9 km	
Replacement Cost - Total Scheme	$3,679,019	Eff. 19 Mar 2019
Average Daily Flow	324 m^3	~~Jun-2019 to May-2020~~

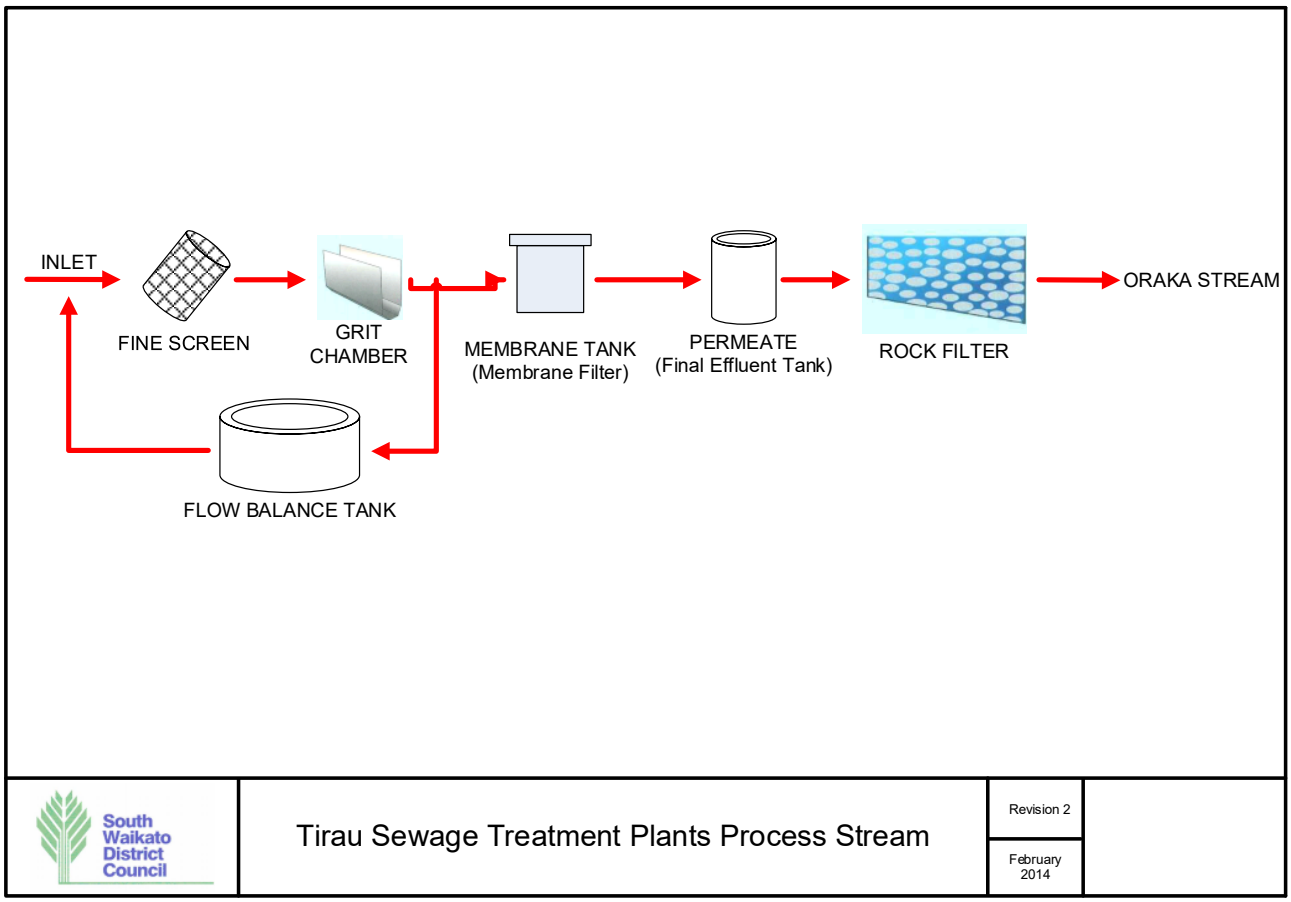


Figure 3.17 Tīrau Wastewater Schematic

Tirau Treatment Plant

The Tīrau sewage treatment plant was commissioned in 1972 for a design population equivalent of 2,000 and currently serves a connected population of about 700 residents. The sewage flows received at the plant are almost totally domestic with less than 1% being from light industry within the town boundary.

The existing “clarigester” primary treatment plant was highly modified in 2005 to contain the membrane bioreactor (MBR) process in which membranes perform the clarification and disinfection stages simultaneously by micro filtration, avoiding the need for a separate clarifier and then a UV stage. The MBR combines the strengths of the conventional activated sludge treatment process and also membrane filtration to provide high quality tertiary treatment.

Wastewater is treated in an aerated basin or tank. The membranes are located in the main tank removing the need for a separate clarifier. The MBR process was installed in the existing clarigester tank making maximum use of the existing infrastructure. The solids and pathogens in the tank are kept at a higher concentration than standard activated sludge treatment processes which reduces the size of the tank required and further reduces the “footprint” area of the plant.

The membrane pore size is such that almost all pathogens are removed along with the solids producing a very high-quality effluent.

A recent study completed by LUTRA[7] has indicated a number of constraints within the Tirau plant, the inlet screen and grit removal system are undersized to meet future growth only having capacities of 26l/s and 15l/s respectively. In addition the MBR has a design capacity of 340m3/day versus an average daily flow of 306m3/day giving little allowance for growth. The existing onsite balance tank is also undersized and this needs to be increased.

[7] Tirau WWTP Capacity and Condition Assessment ECM615015

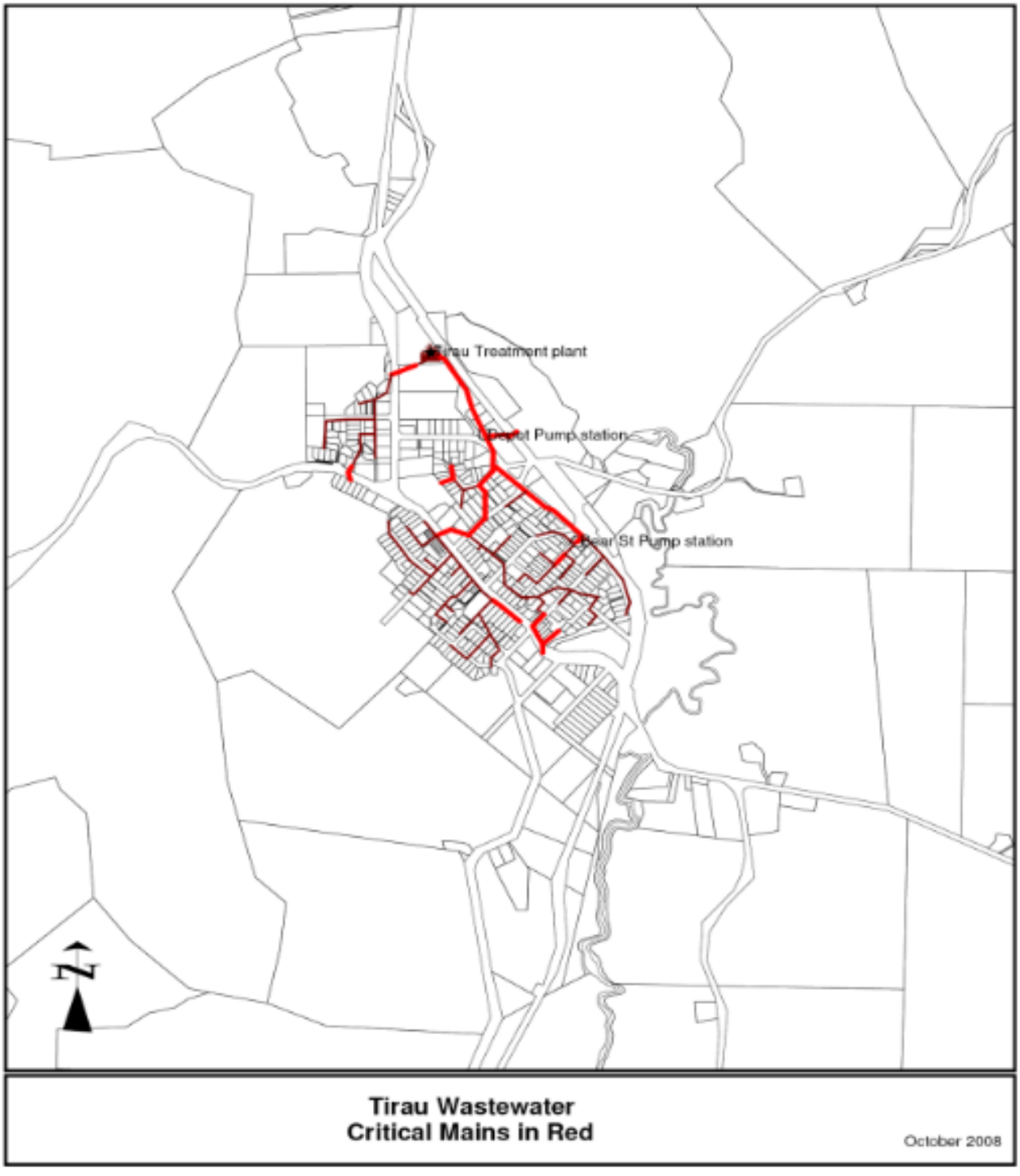


Figure 3.18 Tīrau Wastewater Critical Assets

Tīrau Asset Details

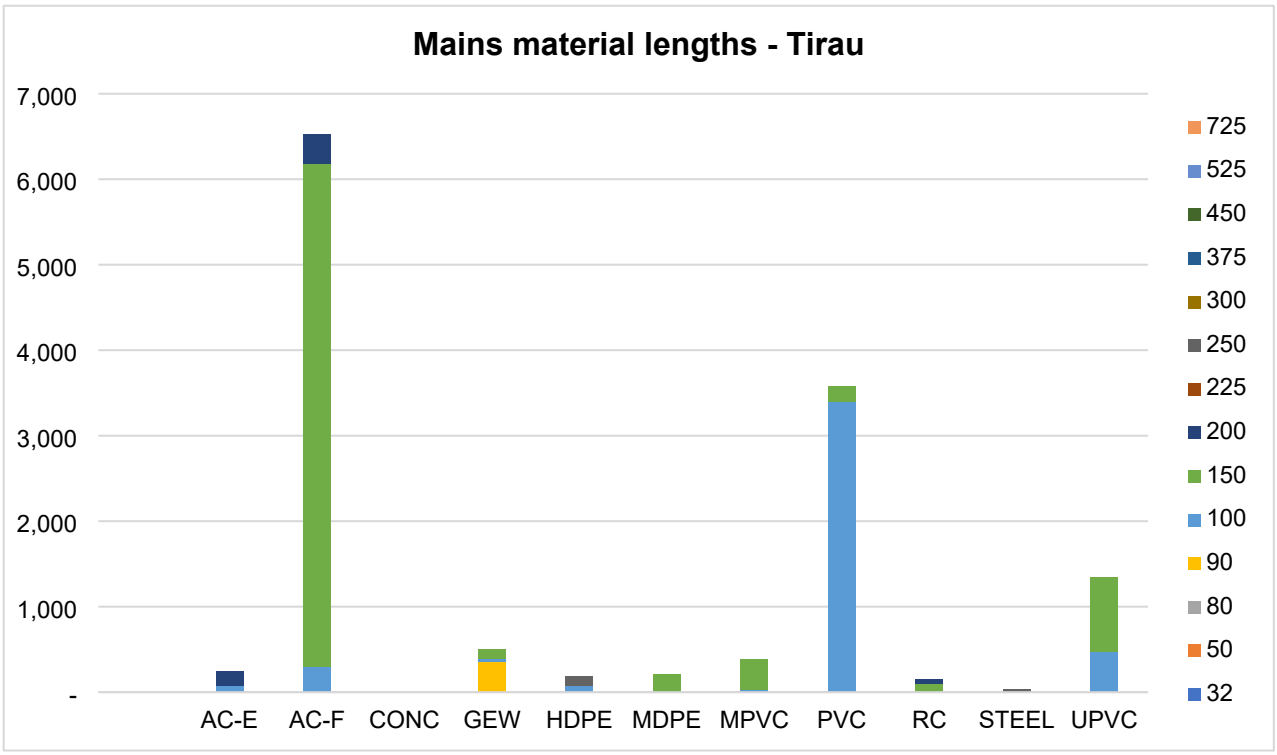


Figure 3.19 Tīrau Mains Material Lengths

Tīrau sewer pipes are majority AC pipes that were installed in the 1960's.

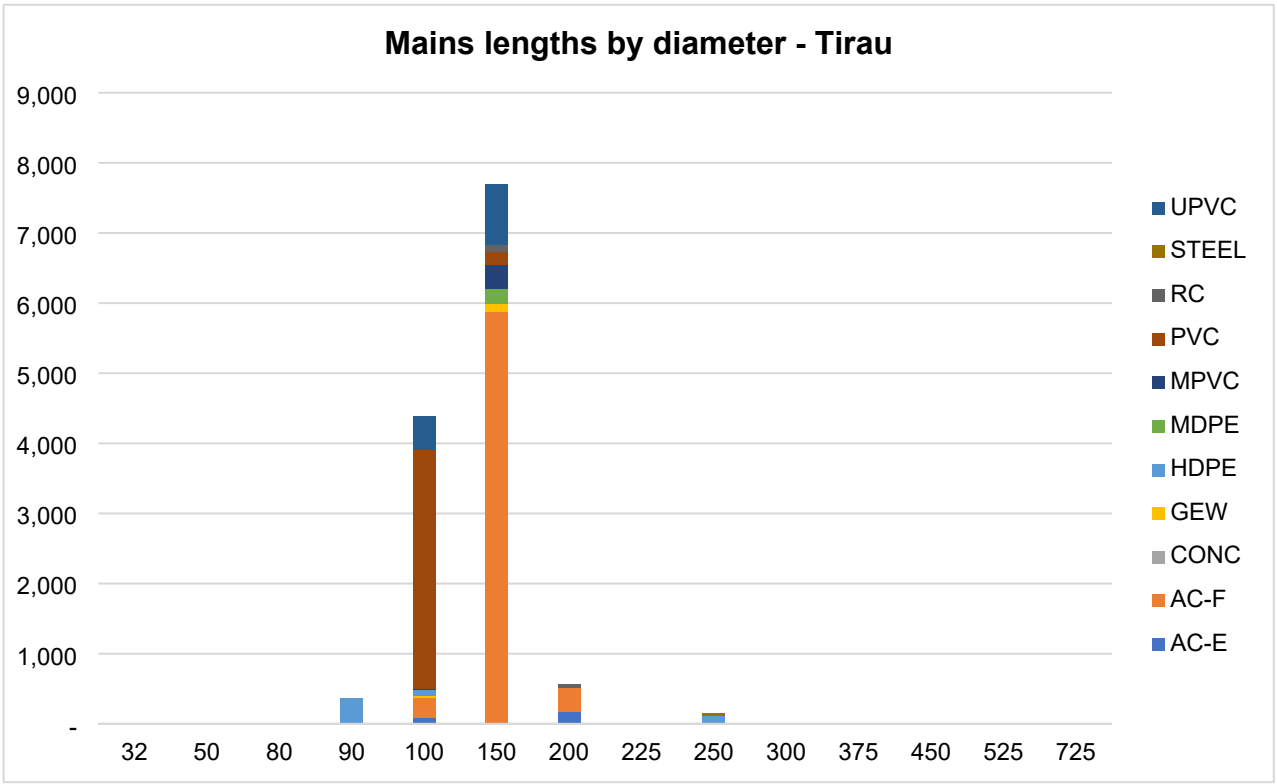


Figure 3.20 Tīrau Mains Diameter Range

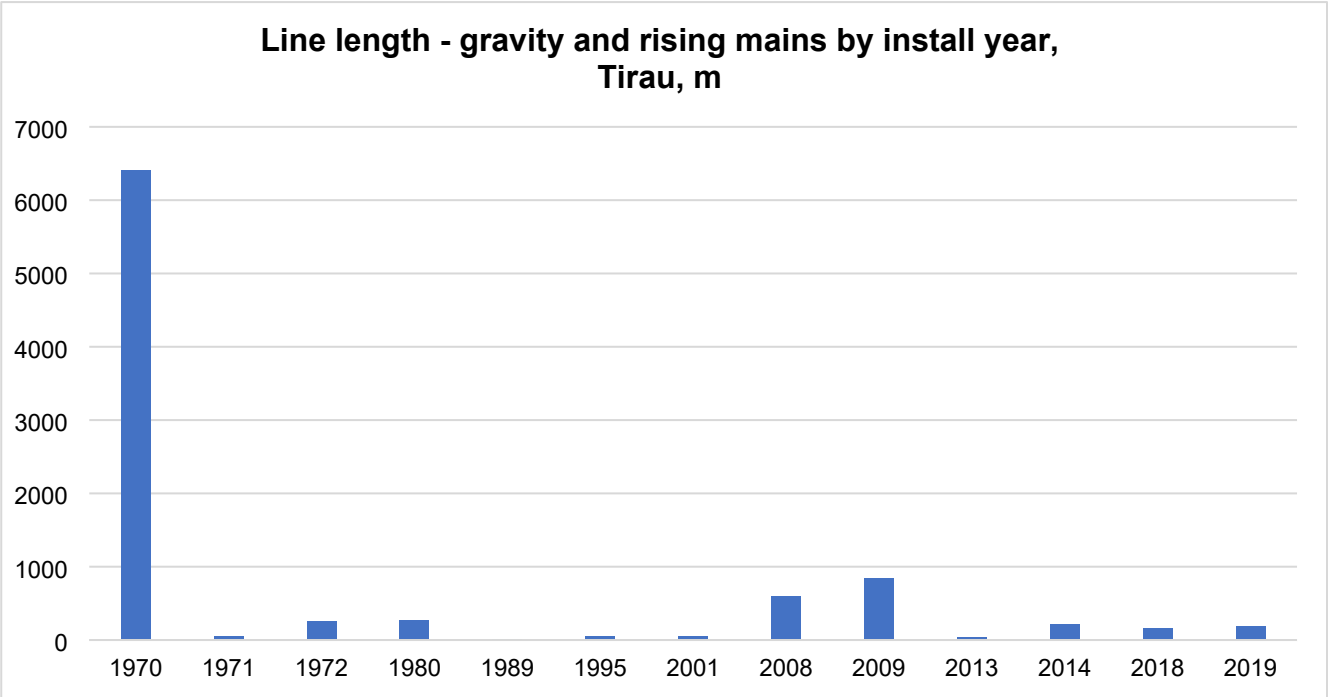


Figure 3.21 Tīrau Mains Install Year

Table 3.11 Tīrau Reticulation Mains - Forecast Renewal Date (in metres)

	AC-E	AC-F	CLSWS	CONC	GEW	HDPE	PVC	PVC-HW	RC	STEEL	UPVC	MPVC	Grand Total
<2021	-	-	-	-	-	-	-	-	-	37	660	-	**697**
2021-2025	-	-	-	-	-	-	-	-	-	-	165	-	**165**
2026-2030	-	-	-	-	-	-	-	-	-	37	165	-	**202**
2031-2035	-	-	-	-	-	-	-	-	-	-	165	-	**165**
2036-2040	-	-	-	-	-	-	-	-	-	-	165	-	**165**
2041-2045	253	-	-	-	-	-	-	-	-	-	165	-	**418**
2046-2050	-	7,237	-	-	-	-	-	-	-	-	165	-	**7,402**
2051-2055	-	94	-	-	-	-	-	-	107	37	165	-	**403**
2056-2060	-	224	-	-	53	-	-	-	-	-	165	-	**442**
2061-2065	-	-	-	-	-	-	-	-	47	-	165	-	**212**
2066-2070	-	-	-	-	-	-	-	-	-	-	174	-	**174**
2071-2075	-	-	-	-	-	-	-	-	-	-	165	-	**165**
2076-2080	-	-	-	-	-	-	-	-	-	37	165	-	**202**
>2081	-	-	-	-	53	521	218	-	-	-	1,468	379	**2,639**
Grand Total	**253**	**7,555**	**-**	**-**	**106**	**521**	**218**	**-**	**154**	**148**	**4,117**	**379**	**13,451**

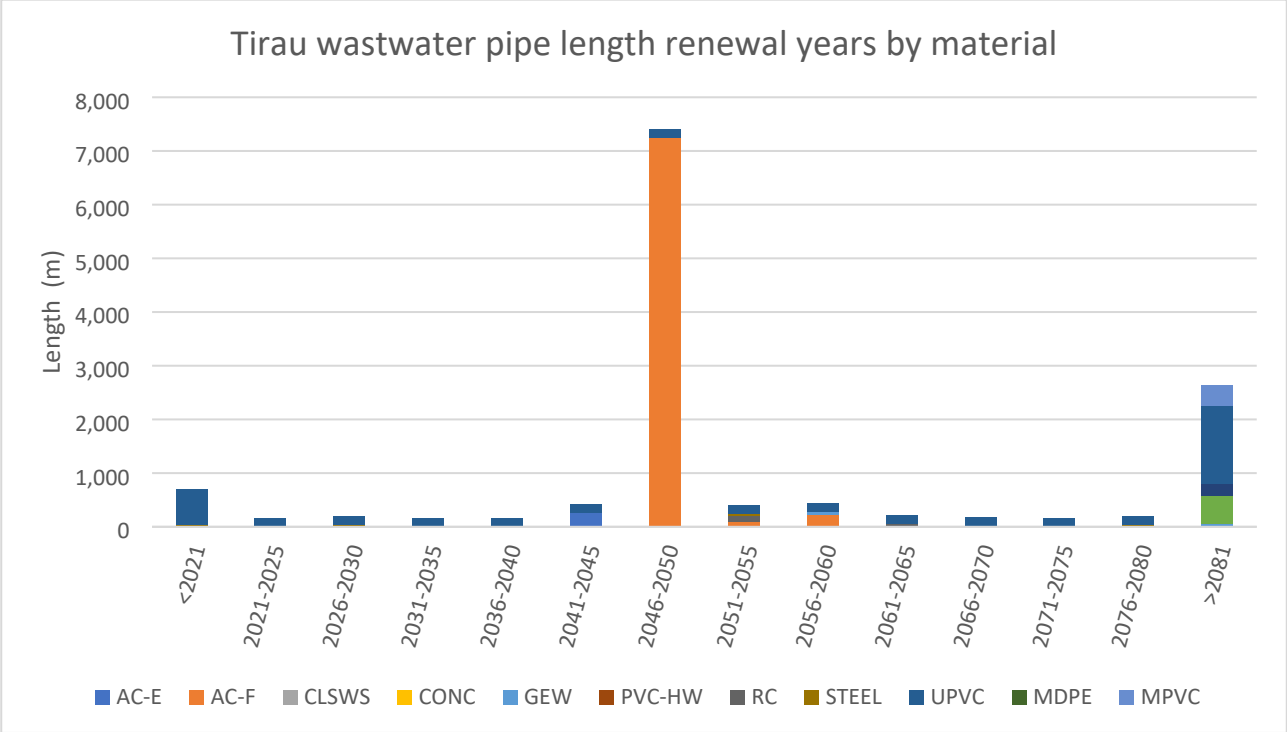


Figure 3.22 Tīrau Reticulated Mains - Forecast Renewal Date

Based on age only the majority of sewer pipes in Tīrau will need replacing in the 2050's, it would be recommended to undertake CCTV inspections of the sewers leading up to this period to determine if the life of some pipes can be extended based on condition.

Table 3.12 Tīrau Total Assets renewals by asset type - Forecast Renewal Date

Renewal Year	LINE	POINT	PLANT	Grand Total
<2021	$10,078	$-	$152,035	$162,113
2021-2025	$2	$-	$356,417	$356,419
2026-2030	$10,072	$-	$648,364	$658,436
2031-2035	$2	$-	$206,704	$206,706
2036-2040	$2	$-	$208,812	$208,813
2041-2045	$46,517	$-	$989,652	$1,036,169
2046-2050	$1,388,985	$527,722	$640,950	$2,557,657
2051-2055	$49,541	$42,250	$320,457	$412,248
2056-2060	$53,241	$33,800	$425,268	$512,310
2061-2065	$9,026	$-	$88,926	$97,952
2066-2070	$1,755	$1,389	$1,005,159	$1,008,303
2071-2075	$2	$4,225	$81,401	$85,628
2076-2080	$10,072	$4,225	$1,089,175	$1,103,472
>2081	$352,901	$219,562	$2,657,860	$3,230,322

Renewal Year	LINE	POINT	PLANT	Grand Total
Grand total	$1,932,195	$833,173	$8,871,181	$11,636,548

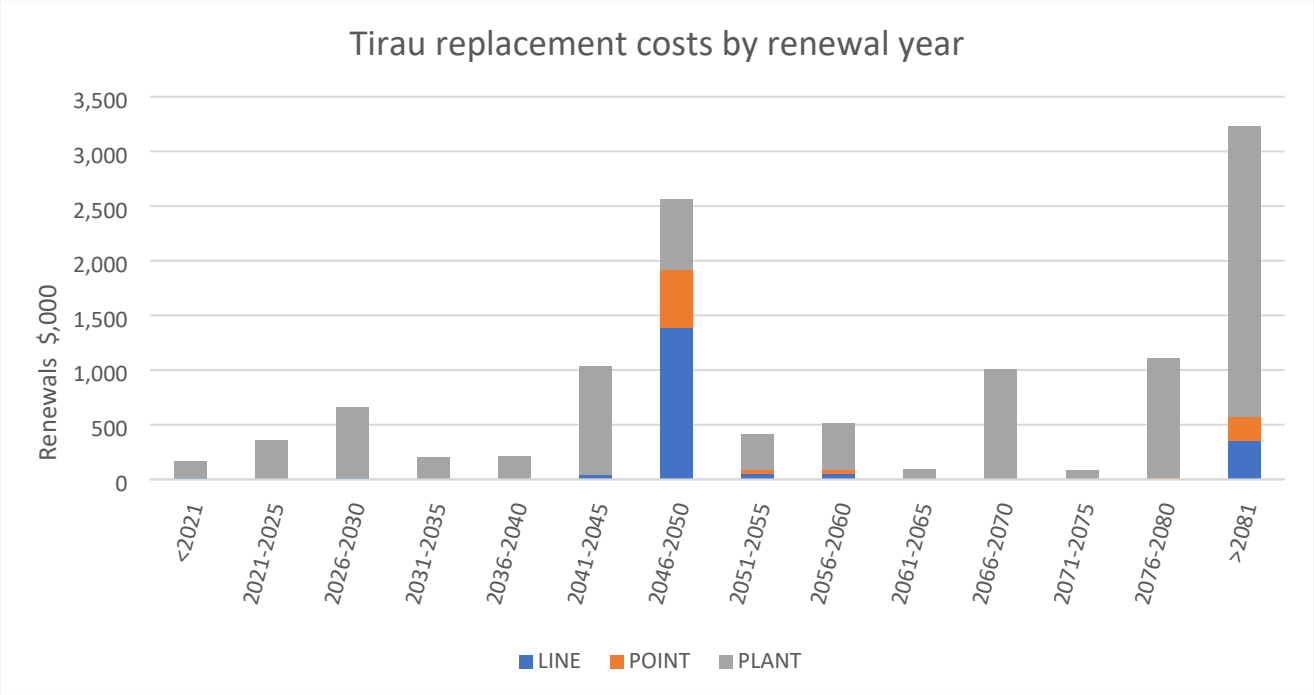


Figure 3.23 Tīrau Assets Replacement Needs Cost - Forecast Life

There are a number of plant items in the Tīrau wastewater plant that are due for renewal between 2020 and 2025, these are items that had a 20-year life at the last upgrade. The condition of these items will be determined at the next AMP process to see if their life's can be changed.

Pump Stations

Table 3.13 Tīrau Pump Stations

Pump stations	Pump install dates	Make	Model	Quantity
Bear St pump station	Jan-17	Sulzer	ABSA-SO630.205	1
	Jan-19	Sulzer/ABS	ASO 641.143	1
Depot pump station	Jan-19	Flygt	MP3102.160MT461	1
	Jun-04		NP3102MT460	1
Parapara Rd pump Station	Apr-09	Flygt	MP3068-HT210	2

Growth

The future modelled scenarios have been created based on a population growth projection of 1% per annum. All new growth has been assumed to be distributed evenly throughout the catchment. No specific growth areas have been identified during the modelling exercise.

Several upgrades have been identified to support growth in Tirau.

Upgrade Options

The following upgrades are recommended to address existing issues and to provide capacity for growth:

- Depot St Pump Station - provide an additional 43 m^3 of storage at Depot Street Pumping Station. Provide additional pumping capacity at Depot Street Station. The station operates as a Variable Speed Station, so this will not affect normal operation. However, it is recommended to increase current peak pumping rate to 44 l/s.
- Bear St Pump Station - increase pumping rate at bear street station to 10 l/s. However, there is still limited information at this site, and so further study is recommended for this site before proceeding.
- Commercial area sewer upgrade - the 150 mm mains servicing the commercial area have been identified as prone to surcharging in the 2-year ARI event. As a result, 360 m of pipe is proposed to be upgraded to 200 mm; however, further survey is required to confirm actual slope (and corresponding capacity) of these pipes.

3.2.4 Arapuni

General Overview

The earliest reticulation within the District commenced in 1928 near Arapuni when the power station was completed by the then Public Works Department. The early reticulation in Arapuni used glazed earthenware pipe with a small amount of concrete pipe whilst upgrading work in the early 1990s used uPVC.

Council took over the village from Electrocorp and the responsibility for this reticulation in 1992. At the time of take-over all sewers were inspected by video camera and all deficiencies identified were repaired or replaced.

Table 3.14 Arapuni Scheme Overview

System Information - Arapuni		Comments
Population	300	Estimate
Properties Connected	120	Eff. June 2020
Pump Stations	Nil	
Treatment Plants	1	Plus 2 septic tanks
Manholes	87	
Reticulation - Length of Mains	4	
Replacement Cost - Total Scheme	$206,423	Eff. 19 Mar 2019
Average Daily Flow	37 m^3	~~Jun-2019 to May-2020~~

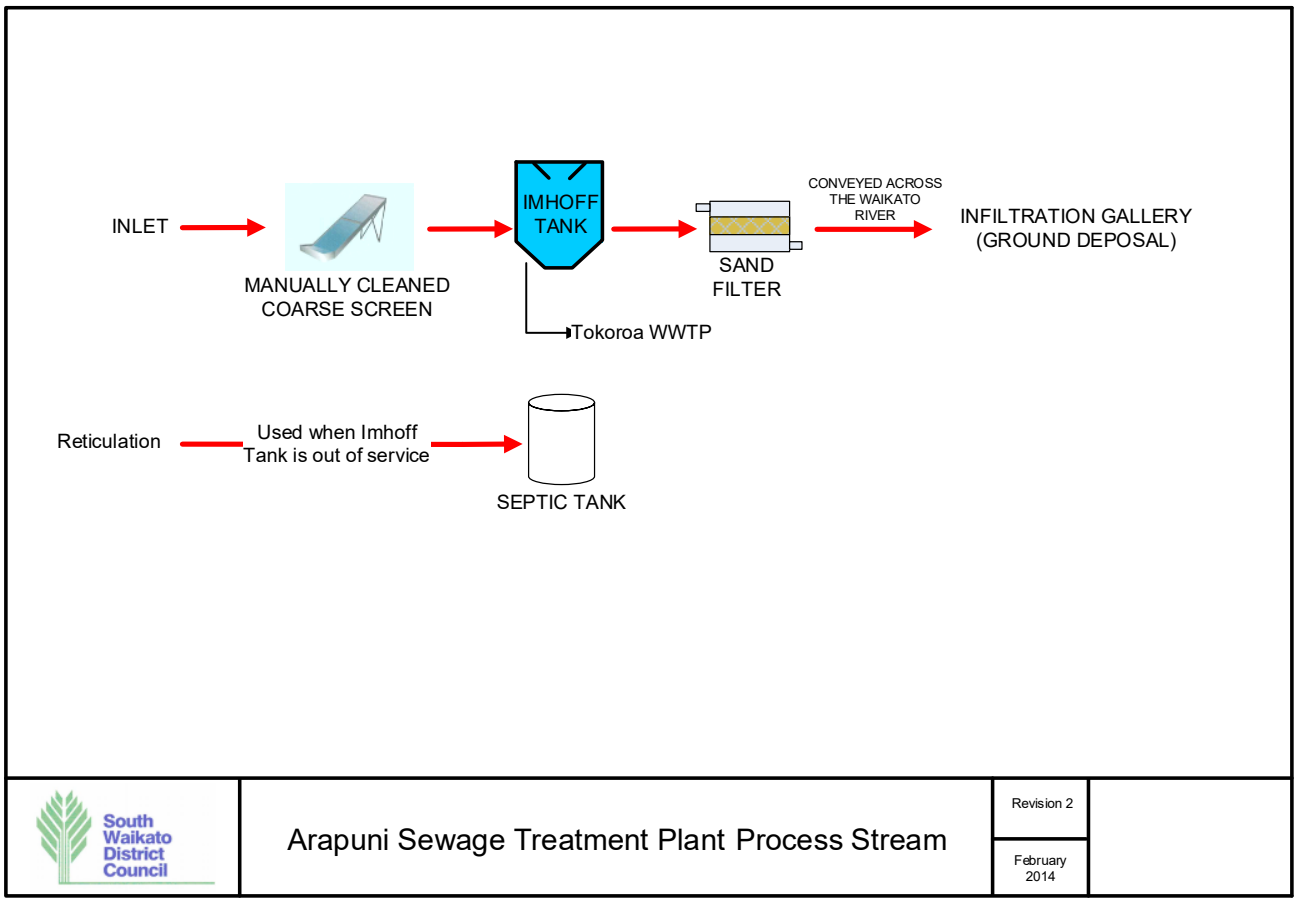


Figure 3.24 Arapuni Wastewater Schematic

Arapuni Treatment Plant

The Arapuni village sewage is given primary treatment in an Imhoff tank. This installation is a standard Public Works design from about 1950, with a manually cleaned coarse screen and sludge drying beds.

Effluent from the Imhoff tank is discharged onto intermittent sand filters, with primary sludge drawn off manually to small drying beds.

In addition, a large septic tank upstream of the Imhoff tank, dating from the early days of the village, remains in the reticulation and has, on occasion, been used when the Imhoff tank is out of service. Several buildings in the village, which are below the sewer grade line, are on individual septic tanks, including the bowling club and service station. Intermittent sand filter beds were added to provide secondary treatment at the time of Council's take-over in 1992. The effluent is conveyed across the Waikato River by aerial pipeline and discharged through an infiltration gallery into a sandy terrace on the western bank. The sand filters have been determined to be in poor condition and are to be replaced with a mechanical package plant.

The intermittent sand filters had a minor renewal in 2019 with the top layer of sand replaced, unfortunately this did not restore the functionality of the sand beds and they now require complete replacement.

The plant serves a domestic population of approximately 300.

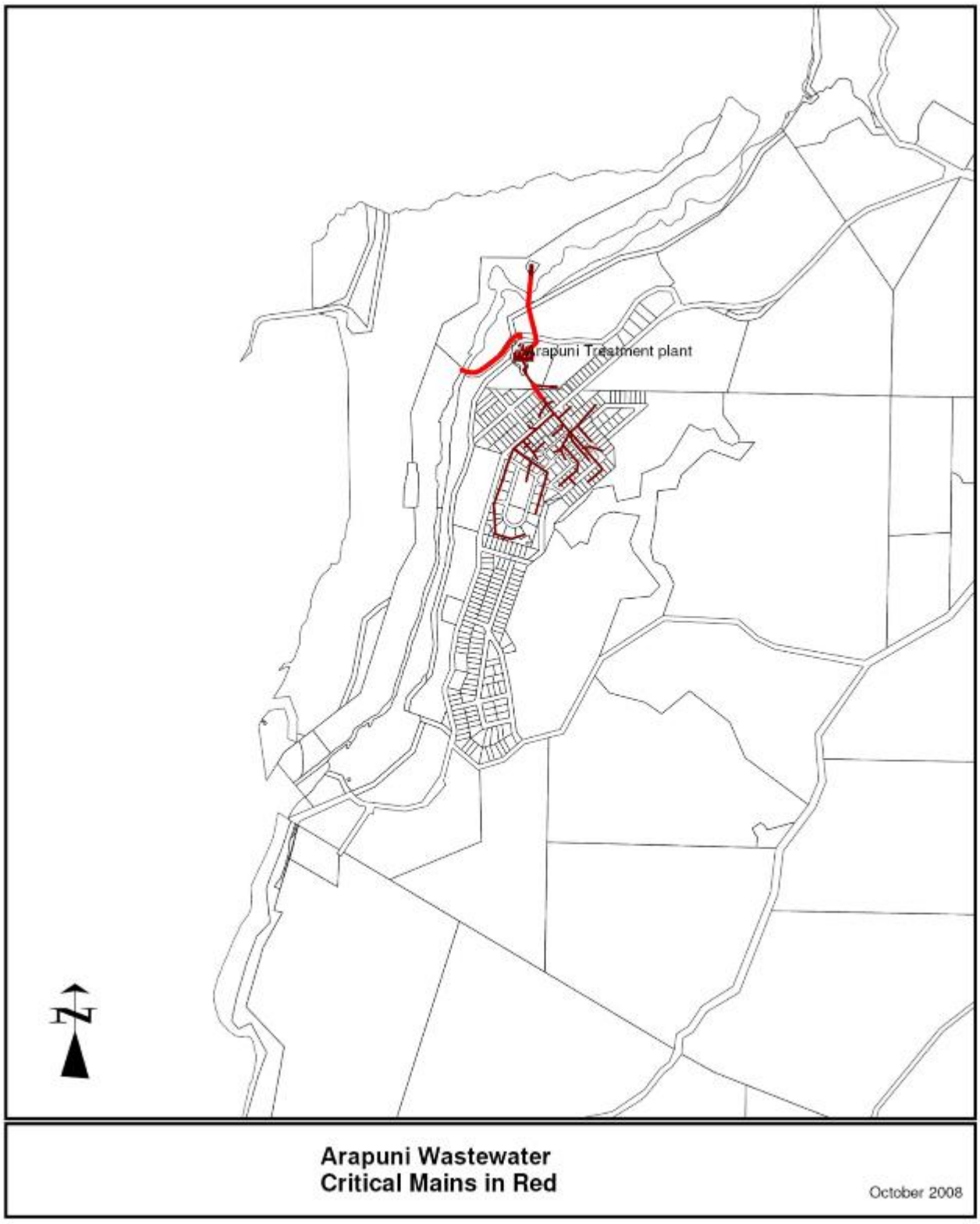


Figure 3.25 Arapuni Wastewater Critical Assets

Arapuni Asset Details

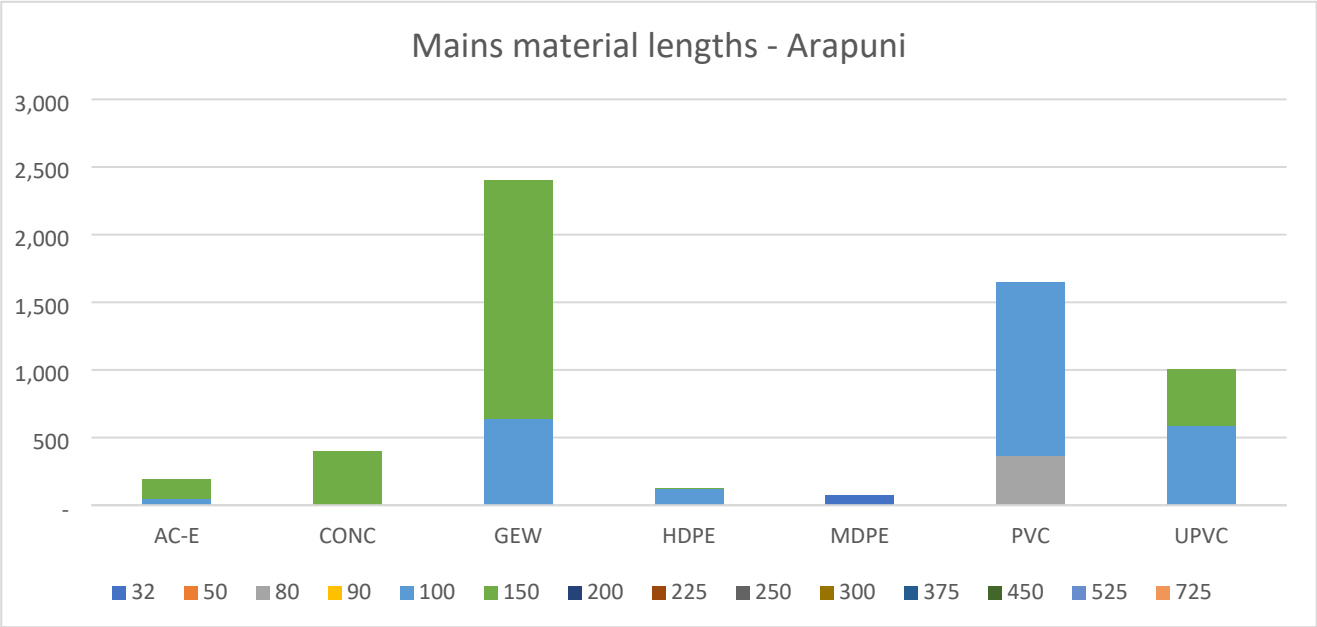


Figure 3.26 Arapuni Mains Lengths by Material

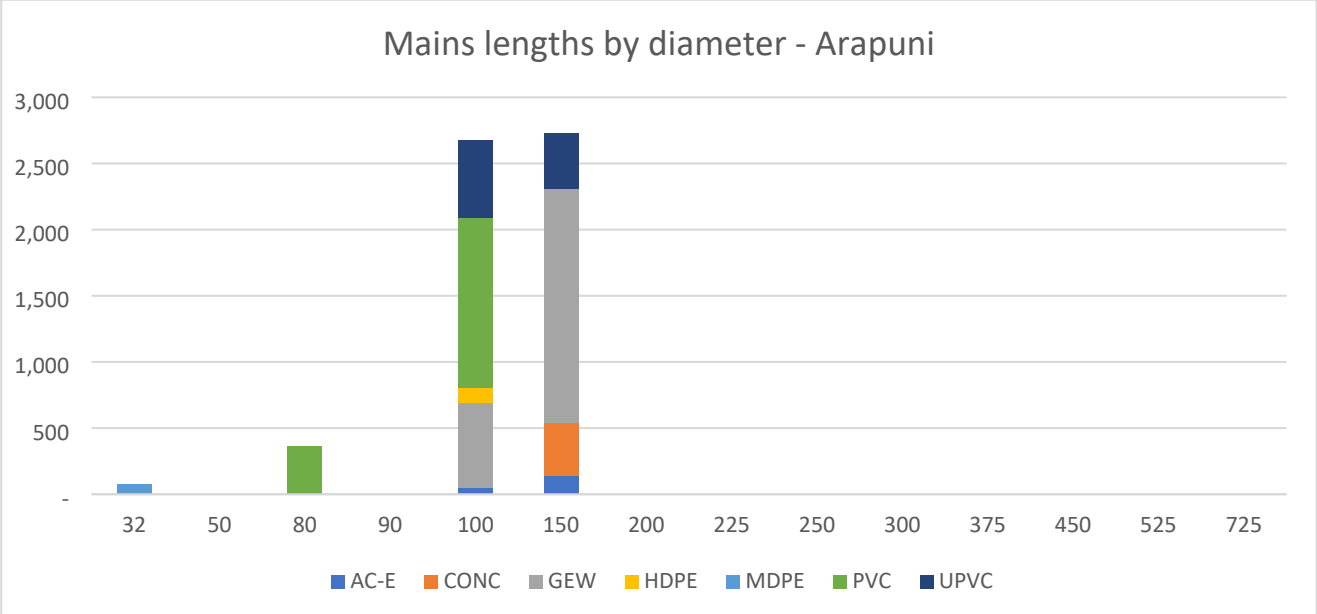


Figure 3.27 Arapuni Mains Diameter Range

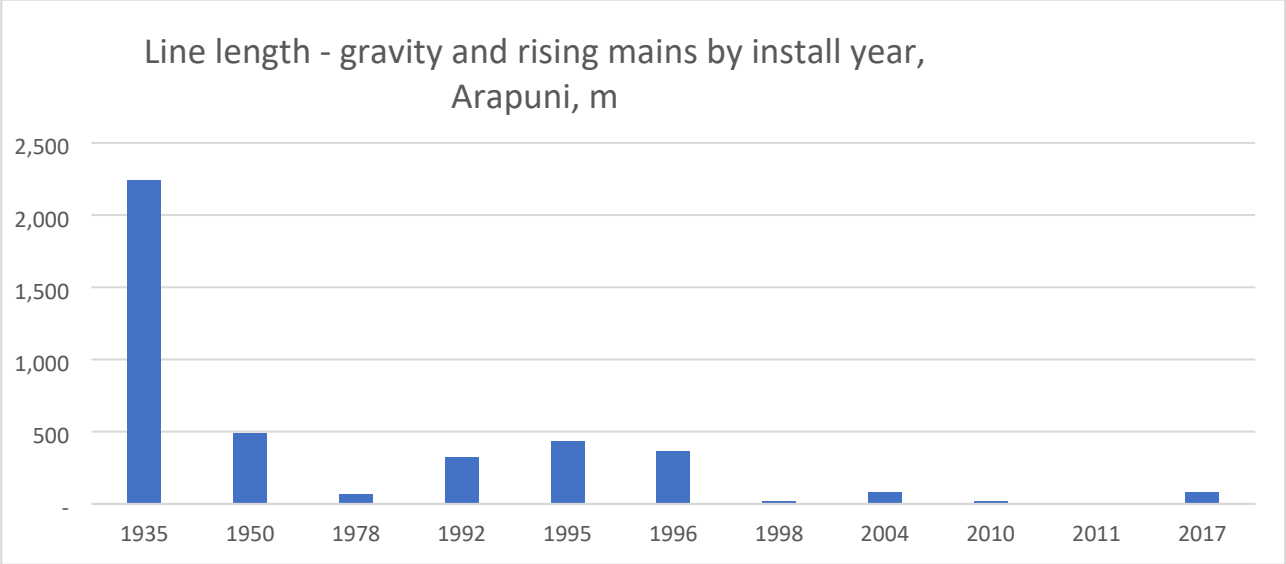


Figure 3.28 Arapuni Mains Install Year

Arapuni is an old hydro town built in the 1930's with the dam, the sewer mains have been inspected by CCTV and found to be in good condition, which has allowed their life's to be extended.

Table 3.15 Arapuni Reticulation Mains - Forecast Renewal Date (in metres)

	AC-E	CONC	GEW	HDPE	PVC	UPVC	Grand Total
<2021	168	82	-	-	-	10	**260**
2021-2025	-	-	2,198	-	-	-	**2,198**
2031-2035	-	319	-	-	-	-	**319**
2036-2040	-	-	170	-	-	-	**170**
2056-2060	-	-	-	-	-	297	**297**
2071-2075	218	-	-	118	-	548	**884**
2076-2080	-	-	-	-	364	14	**378**
>2081	57	-	94	6	131	117	**405**
Grand Total	**443**	**401**	**2,462**	**124**	**495**	**986**	**4,911**

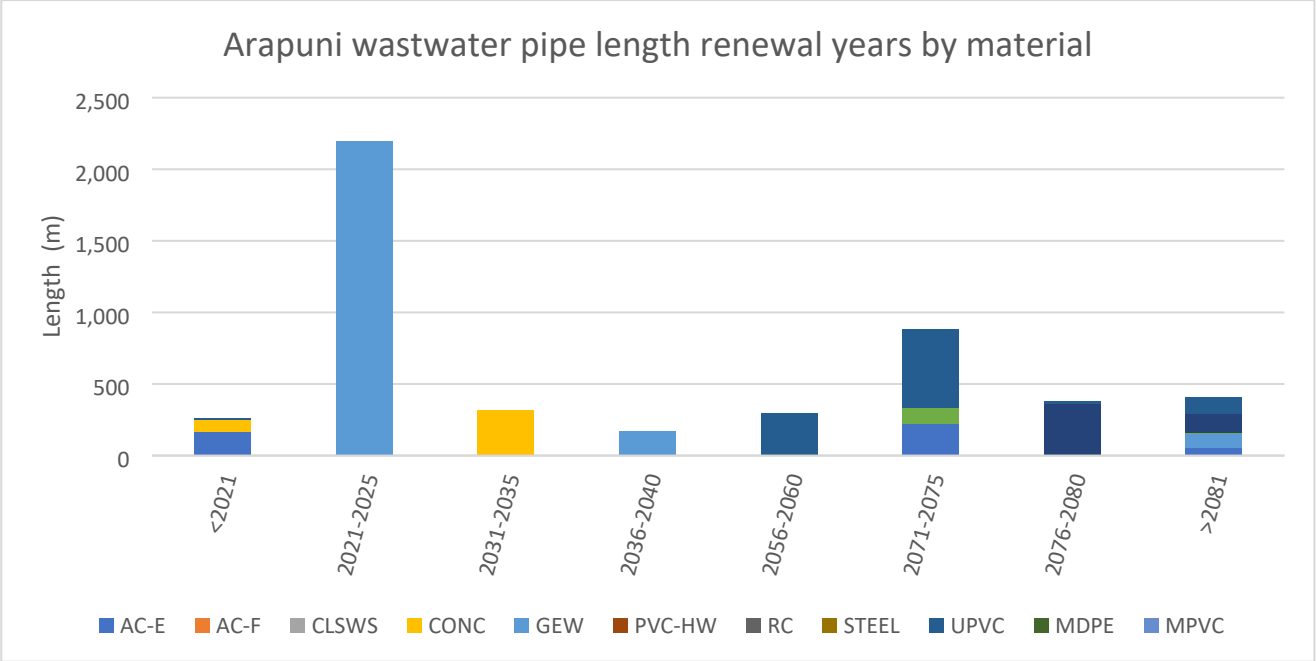


Figure 3.29 Arapuni Reticulated Mains - Forecast Renewal Date

Table 3.16 Arapuni Assets Renewal by asset type - Forecast Life

Renewal Year	LINE	POINT	PLANT	Grand Total
<2021	$49,251	$285,628	$15,180	$350,059
2021-2025	$387,509	$18,179	$10,873	$416,561
2026-2030	$-	$67,300	$17,097	$84,397
2031-2035	$61,190	$-	$100,275	$161,465
2036-2040	$28,469	$-	$9,416	$37,885
2041-2045	$-	$-	$21,534	$21,534
2046-2050	$-	$7,791	$9,121	$16,912
2051-2055	$-	$-	$20,758	$20,758
2056-2060	$42,256	$4,225	$18,796	$65,277
2061-2065	$-	$-	$56,495	$56,495
2066-2070	$-	$18,179	$54,543	$72,722
2071-2075	$160,339	$65,289	$19,435	$245,063
2076-2080	$32,873	$9,550	$30,775	$73,198
>2081	$70,551	$335,264	$50,422	$456,237
Grand Total	$832,438	$811,405	$434,719	$2,078,562

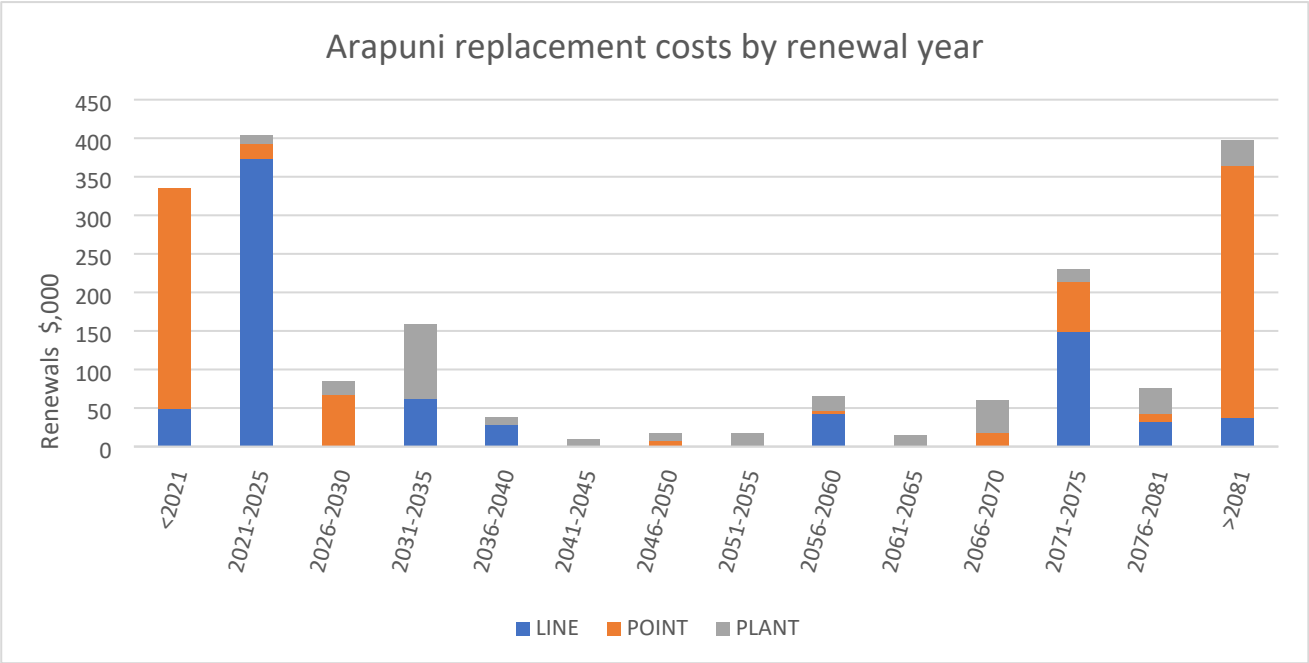


Figure 3.30 Arapuni Total Assets Renewals by asset type - Forecast life (2021)

Pump Stations

There are currently no pump stations located in Arapuni.

The first pump station installation project for Arapuni is proposed in the New Works scope (Section 6.10.1) to service a small development on the west side of the township at 55 – 57 Arapuni Rd including the bowling club.

A new pump station is required to service this small development on the west side of the township at 55 – 57 Arapuni Rd including the bowling club. The properties are currently connected to an old septic tank and associated disposal field which is in a poor condition, in addition land disposal within an urban area is not best practice.

3.3 Asset Information (Data Quality/ Completeness)

The Confidence Level of Asset Information based on asset data quality, completeness and currency varies from Very Uncertain to Reliable as shown following.

Table 3.17 Assessment of Confidence in Key Inputs to Programmes

Assessment of Confidence in Key Inputs to Programmes					
	Attribute	**D Very Uncertain**	**C Uncertain**	**B Reliable**	**A Highly Reliable**
1	**Unit cost for Replacement**				
2	**Condition/Remaining Life:**				
2a	***Above-ground Civil, Mechanical & Electrical***				
2b	***Buried Components***				
3	**Asset Size**				
4	**Not applicable**				
5	**Material**				
6	**Date of Installation**				
7	**Asset Type**				
8	**Location**				
9	**Length (pipelines)**				
10	**Quantity (other assets)**				
11	**Deterioration Rates:**				
11a	***Above-ground Civil, Mechanical & Electrical***				
11b	***Buried Components***				
12	**Asset Performance**				
13	**Demand Information**				

Notes:

2, 6, 11b: While condition, remaining life, material, and installation date and deterioration rates are not as accurate as desired, faults frequency generally demonstrates that within this ten-year plan period, buried components are unlikely to require significant renewal. Depreciation rates have been conservatively set, so that in future plan periods there should be adequate funding to sustain a renewal programme based on better data.

4 Levels Of Service

4.1 Summary of Levels of Service

Following on from the definition of Council's Vision, Outcomes and Strategies the relevant Council units responsible for delivering services to the community have defined specific Levels of Service (LOS) that describe what the customer will receive from a particular activity.

The LOS are associated with **Performance Measures** that are expressed in both customer and technical terms.

Key Performance Indicators have been developed for the purpose of monitoring and reporting by the service provider, to ensure that the service is being delivered to the defined performance level.

In addition to the above, the Department of Internal Affairs has gazetted in November 2013 a series of Mandatory Non-Financial Performance Measures that have been addressed in the LTP and supporting AMPs. The measures address the five core services areas of Water Supply, Wastewater, Stormwater, Roads and Flood Control. SWDC has no flood control schemes.

The Performance Management process ensures that all activities are coordinated and aligned with the global objectives of the LTP and are described in detail both there and in the individual AMPs.

A "Service Level Gap" exists when the reported results of service level monitoring are lower than the service level "target". Customer service level gaps may arise from a difference between perception and expectation, particularly if a service level is expressed in terms of public satisfaction. From this point, improvements can be developed that may involve altering the parameters of fixed assets or altering process features.

The results of Council's regular customer surveys, which include "public satisfaction", can be influenced by factors unrelated to actual measured service, such as 'how well council communicated its achievements', and the general attitude of respondents to the Council.

To deal objectively with shortfalls requires a clear distinction to be made between perceived and technical levels of service. The service levels adopted in the AMPs generally avoid use of "customer satisfaction", reflecting the advice of the Auditor-General.

4.2 Stakeholder's Wishes & Expectations

4.2.1 Identification of Stakeholders

The following table lists those who have significant specific involvement with the assets (and/or the service facilitated by the assets) and describes their particular main interests. The table is limited to the main issues for key stakeholder groups. ‘Public Service providers’ include schools, dentists, doctors, hospitals, and other government organisations. ‘Asset Managers’ are those District Council staff (Engineers and others) whose responsibility it is to manage the services made possible by the assets covered in this AMP.

Table 4.1 Identification of Stakeholders and Interests

External Stakeholders	Main Interests
Central Government	Ensure that Local Government Act is complied with (via Auditor-General)
Resident Population	Reliable, healthy wastewater service at an affordable cost
Local Businesses/Industries	Wastewater service to suit commercial needs and expansion, at affordable cost
***Public Service Providers**	Reliable, healthy wastewater service at an affordable cost
Ministry of Health	Wastewater service quality is suitable, consistently assured, does not spread diseases
Tangata Whenua	Respect for spiritual/cultural significance of wastewater and land affected
Council's Service Providers	On-going work: processes and systems to facilitate efficient operations
Regional Council	Wastewater discharge has no significant effect on the environment
Local Authority Shared Services Ltd (LASS)	Provide the local authorities of the Waikato region with a vehicle to develop shared services. Jointly owned by 13 local authorities. Beneficial to the community through enhanced services and/or reduced costs
Internal Stakeholders	Main Interests
Elected Officials	Owner of assets, responsible for sustainable service levels under LGA
Executive	Compliance with regulations, service reliability, quality and economy
Asset Managers	As above plus policy, planning and implementation of infrastructure and service management activities (e.g., operations, demand management, maintenance, construction). Safety. Effective corporate support for decision-making, service management, procurement, finance, communications, I.T., staff and other resources
Planners	AMP support for Long-term Council-Community Plans. Infrastructure support for current/future district activities (housing, business, recreation)
Finance	Proper accounting for assets and for services consumed by asset management activities. Reliable, justified projections of future costs
	On-going work: processes and systems to facilitate efficient operations
Customer Services	Systems which minimise and resolve complaints/enquiries about service
Information Services	Clarity of technical and budget requirements for systems and support

*Public service providers include schools, dentists, doctors, hospitals, and other government organisations.

4.2.2 Residents Survey 2020

The community satisfaction survey asked how they would rate their satisfaction with their wastewater services.

Table 4.2 Council Water Management Satisfaction Levels

Council Activity	2018 Satisfaction Level	2019 Satisfaction Level	2020 Satisfaction Level	2020 Sample size
Overall satisfaction with Council's **Water Management**	85%	84%	80%	361
Wastewater system reliability	95%	97%	98%	275
How Council treats and disposes of wastewater	94%	96%	94%	186

The overall satisfaction figures include the categories somewhat satisfied, satisfied and very satisfied

4.2.3 External Mandated Standards

No external mandated standards are identified.

4.2.4 National Strategies and Plans

National Infrastructure Plan

The National Infrastructure Plan (NIP) details the Government's view of the challenges and priorities for infrastructure. The 2015 NIP describes the view to 2045.

A Vision for New Zealand's Infrastructure in the NIP is:

- By 2045 New Zealand's infrastructure is resilient and coordinated and contributes to a strong economy and high living standards.
- More specifically the vision for the Water Sector is:
- The sector will be recognised for its mature asset management practices across all providers, underpinned by reliable and accurate data on the state and performance of the network to support better decision-making. A key focus is optimising the existing three waters network.

The National Infrastructure Plan sets out six specific goals for water infrastructure, which have broad implications for local government in water infrastructure development, operation, management, and reporting.

National Policy Statement Freshwater Management

The National Policy Statement for Freshwater Management 2020 sets out the objectives and policies for freshwater management under the Resource Management Act 1991. It came into effect on 3 September 2020 and replaces the National Policy Statement for Freshwater Management 2014 (amended 2017).

Government has noted this as Part 1, to be followed by

Water limit setting – includes non-point source discharges such as those from agricultural practices

New regulatory tools – designed to properly manage limits

Requirements of the Freshwater NPS include:

- Manage freshwater in a way that 'gives effect' to Te Mana o te Wai:
- Improve degraded water bodies, and maintain or improve all others using bottom lines defined in the Freshwater NPS
- Avoid any further loss or degradation of wetlands and streams, map existing wetlands and encourage their restoration

Key and Regulation– Implications for Asset Management

Legislation is established by Central Government and must be complied with at Local Government Level. Significant legislation and regulations affecting the Wastewater activities are provided in the table below. Council must comply with any relevant legislation enacted by Parliament. Commentary related to some of the key legislation is provided below.

Table 4.3 Legislation and Regulation Affecting the Wastewater Activity

Legislation & Regulation	Asset Group Impacted	Impact Range
Building Act 2004 (and amendments)	All	*
Central North Island Forests Land Collective Settlement Act 2008	All	*
Civil Defence Emergency Management Act 2002 (amended 2016)	All	***
Climate Change (Emissions Trading and Renewable Preference) Act 2008	All	*
Climate Change Response Act 2002 (amended 2019)	All	**
Energy Efficiency and Conservation Act 2000	All	*
Environmental Protection Authority Act 2011	All	*
Epidemic Preparedness Amendment Act 2010	All	*
Health Act 1956	Water, Wastewater, Landfill	***
Health and Safety at Work Act 2015 (and amendments)	All	***
Historic Places Act 1993 (and amendments)	All	*
Infrastructure (Amendments Relating to Utilities Access) Act 2010	All	**
Local Government Act 2002 (and amendments)	All	***
Local Government Act 1974 (and amendments)	All	**
Local Government (Financial Reporting) Regulations 2011	All	*
Local Government Rating Act 2002 (and amendments)	All	**
Local Government Rating Act 1979	All	*
Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011	All	*
Public Works Act 1981 (and amendments)	All	*
Railways Act 2005	Transport Utilities	*
Railway and Corridor Management and Safety Act 1992	Transport Utilities	*
Reserves Act 1977 (and amendments)	Community All	** *
Resource Management Act 1991 (and amendments)	All	***
Transit New Zealand Act 1989	Transport	*
Utilities Access Act 2010	All	***
Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010	All	*

Different legislation has differing levels of impact on the groups of activities; this is indicated under Impact Range (Broad ***, Moderate **, Limited *)

Major Legislation Details

The legislation that has or will have the most effect on the Wastewater Activity is expanded in the following section.

Civil Defence Emergency Management Act 2002 (Amended 2016)

The expectations under the CDEM Act 2002 are that Council's services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level. In addition, Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within our boundaries.

The most recent amendments allow for the appoint of statutory recovery managers, and requiring recovery planning, strengthens the law to help communities to recover from small to moderate emergencies and recognises that there are times when communities are not in an emergency, but "BAU" powers are not enough.

Water supply and wastewater are regarded as critical services and are given special consideration within Council emergency management procedures. Every effort will be given to restore services immediately after an event to at least provide adequate water for sanitation and health albeit supply quantity may be limited.

Health Act 1956

The Health Act 1956 places an obligation on Council to improve, promote and protect public health within the District. The provision of water and wastewater services conserves public health and helps to protect land and waterways from contamination.

The Health Act requires Council to furnish from time to time to the Medical Office of Health such reports as may be required as to diseases, drinking water and sanitary conditions within the District.

Local Government Act 2002

Council's 30-year Strategy must address the "core activities" of water supply; wastewater; stormwater; flood protection and control; roads and footpaths; as well as any other assets that the local authority wishes to include. It is prepared separately from the AMPs but aligned with them and is included in the LTP.

In addition to the general requirements of the Local Government Act there are some specific clauses that apply to Wastewater services.

S125 places a requirement to assess water and other sanitary services from time to time

S130 imposes an obligation to maintain water services and places limitations on the transfer or selling of assets

S136 empowers Councils to enter into Contracts relating to provision of water services for periods not exceeding 35 years whilst maintaining control over the pricing of the service, retain legal responsibility for the service and being responsible for the development of policy related to the water services

S137 empowers Councils to enter joint local government arrangements and joint arrangements with other entities for the provision of water services, with the same constraints as S136

Resource Management Act 1991

The RMA 1991 provides an environmentally conscious framework for Local and

Authorities to administer powers with regard to development and the management of natural resources. The RMA 1991 focuses on the effects of activities rather than on the activities themselves. SWDC's District Plan provides the rules that apply to subdivision, land use consent and development in conjunction (where necessary) with Waikato Regional Council's regional plans – (see above) that also provide for the abstraction of water and discharges to the environment.

Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011

The legislation provides for improving the health and well-being of the Waikato River through a partnership arrangement between iwi and the Crown. Part of the legislation covers co-management arrangements for the

Waikato River from Te Toka a Tia near Taupō through to Karāpiro and the first agreement was signed with Raukawa on 10 May 2012 at Pikitu Marae, south-west of Putāruru,

The Waikato River Authority is a statutory body formed under the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and is the sole Trustee of the Waikato River Clean-up Trust whose role is to fund projects that meet the purpose of the Authority.

Waikato Regional Plan and Regional Policy Statement

The Waikato

Plan is fully operative and implements the Regional Policy Statement. The Plan provides direction regarding the use, development, and protection of natural and physical resources in the Waikato region. The Plan contains modules covering Matters of Significance to Māori, Water, River and Lake Beds, Land and Soil, Air, and Geothermal Resources.

Effects on asset management include:

- Waikato River Authority requirements regarding taking water and discharging treated effluent
- Allocation and use of fresh water
- Adapting to climate change
- Integration of transportation and land use

Proposed Plan Change 1 (Healthy Rivers) will have an impact long term on water usage takes and discharges in the Waikato Region. The effects on wastewater disposal long term are unknown at this time.

4.2.5 Standards, Codes of Practice and Guidelines

AS/NZS Standards

Regional Infrastructure Technical Standards

The council has adopted the Waikato Regional Infrastructure Standards as the principal document outlining our requirements for wastewater infrastructure. This covers specific requirements for wastewater reticulation and pump stations.

South Waikato District Bylaws & Policies

Council has a number of bylaws in place to assist in the operation of the wastewater activity, which includes the Trade Waste Bylaw 2017 and the Water Supply Bylaw. These Bylaws helps to protect the infrastructure and the public from the effects of substandard construction, connections and other misuse of the assets and control the use of water.

Council reviews the Trade Waste Bylaw 5 yearly to ensure the bylaw is relevant and applicable to the SWDC environment.

In addition, there are a number of policies in place to help manage the activity including the Private Wastewater Drains Policy ECM184080 which sets out the rights and responsibilities surrounding private wastewater drains and how blocks or breaks are to be handled.

Zonings and Easements (District Plan)

Wastewater infrastructure can be installed in Council road reserves as of right, but these are shared with other designated utility operators. Council controls the location of infrastructure and also the programming, quality and timeliness of reinstatement. More information is available in the Land Transport Asset Management Plan.

Council assets on private land are protected from interference, and access to them for maintenance is ensured, by legal easement, provisions in the Local Government Act, or under by-laws.

Infrastructure situated on or under state highways is protected by utility operator legislation/regulation which gives Waka Kotahi New Zealand Transport Agency (NZTA) the right to control the location and standard of construction, and gives the Council the right to enter, construct, maintain and protect the assets.

Other References

- Waikato Regional Infrastructure Technical Specifications
- NZS 4404:2004 Land Development and Subdivision Engineering

4.3 Assets Constraints to Levels of Service

This section lists constraints imposed by the existing assets, which may affect current or future levels of service, and explains why each is relevant.

4.3.1 Capacity

Key capacity constraints associated with each component group are as follows:

Service Connections

There is no known capacity constraint associated with wastewater service connections. Although Council does not provide these pipes, it still has a statutory obligation to mitigate and resolve public health issues arising from any part of the wastewater activity.

The primary means of enforcing sewer connections is the Councils Operative District Plan Section 18 “Subdivision and Development”, and the “means of compliance” standards contained in the SWDC Code of Practice for Subdivision and Development.

Public Networks

Capacity constraints are a factor of pipe diameter and grade. Sections of pipe with flat grades will accumulate grit and other deposits, reducing their capacity.

Ground water infiltration and unauthorised storm water connections may overload the capacity of the public sewer network during heavy rain. This potential overload is managed by monthly checks of dry and wet weather flows received by the treatment plants. The ratio of ‘wet to dry’ flows is considered lower than the stage where additional asset maintenance is considered economic.

Treatment Plants

Notwithstanding the overload that can occur due to ground water infiltration and unauthorised stormwater connections, treatment plant capacity constraints may arise due to:

- Finite storage capacity for untreated effluent at the start of the process
- Limits to minimum time and maximum flow rate for effective separation/settlement of suspended solids
- Conversion/digestion of bacteria and sludge due to limited media surface area, heating energy generation and biochemical process time requirements
- Limits to flow rate through clarifiers for effective processing
- Limits to flow rate through trickling filters for effective polishing
- Limits to hydraulic surging, and quality in the FAST influent stream
- Limits to flow rate through and/or light output of UV sterilisers
- Limits to drying bed effectiveness and moisture content of material that can be removed for cartage
- Limits of storage, and mixing in the primary (heated) digester

As mentioned in 3.2.3 the Tirau WWTP has an existing capacity constraint both in the headworks and the MBR which will need addressing to meet future growth projections and LOS requirements

Consents

Permitted discharge volumes represent a capacity constraint. However, these are only likely to be exceeded in high rainfall events.

4.3.2 Reliability and Security of Supply

The following comments relate to reliability and security of the installed assets and are not intended to cover major disruptions such as seismic activity. Response planning both for typical plant failures and for major events is properly the subject of an Emergency Response Plan. Council's planning is carried out under the guidelines of its Risk Management Policy which is further discussed in Chapter 6. An assessment of risks related to the Wastewater systems has been prepared. Please refer to Appendix E.

Public Networks

There is, limited capacity for storage in the gravity pipes themselves, which can be utilised by deliberately blocking an upstream pipe at a suitable manhole. This provides time to either carry out repairs or arrange pumping and road tanker disposal of the effluent if necessary.

Pump Stations

With the exception of the Sports Ground and Satco Drive Pump Stations, which are not continuously required, all have either two or three pumps. Pump breakdown is therefore covered by redundancy. The majority of pump stations are designed to Council's adopted standards, with some pump stations only having sufficient storage capacity for 1 to 2 hour's typical dry weather inflows. Electricity supply interruptions of much more than an hour could lead to wastewater overflows. Mitigation measures include provision for:

- Inflows to be stopped and stored in the upstream manholes subject to their capacity without overflowing
- Mobile pumping plant to take effluent from pump wells and cart to adjacent gravity pipe system manholes or the treatment plant
- Temporary portable power generator. All wastewater pumping stations are now fitted with emergency generator plugs.
- Overflows to land followed by clean-up activities
- Overflows into waterways as a last resort in extraordinary circumstances
- Drawing down the pump station deliberately before a scheduled power outage to maximise storage capacity before the disruption

Treatment Plants

The treatment plant assets which might be subject to unplanned failure are the mechanical and electrical components such as pumps, fans, motors, and control gear. These duplicated so that they can be taken out of service regularly for operational maintenance and afford a good level of redundancy.

Large concrete tanks, screens, pipe systems and similar assets are unlikely to fail and can either be temporarily bypassed or their functions divided internally without stopping the process. Biological treatment processes can be impacted by changes in the sewage or external environments; and can take time to recover to full operating efficiency.

While treatment output may be temporarily reduced in failure situations, the effluent inflow can be stored in the primary structures for a limited period. Pipework, valving, and pumps enable the effluent stream to be diverted in some instances. In the event of power failure some treatment phases are reduced in capacity, and primary treated sewage flows through the plant by gravity.

Consents

The continued ability to discharge treated wastewater into streams and rivers is a component of supply security. Although all consents issued by Waikato Regional Council include an implicit right to amend conditions or revoke the consent, this is both unlikely to occur and can be appealed by Council.

4.3.3 Environmental Performance

The nature of reticulated wastewater, including unauthorised connection of storm water systems, makes intermittent breaches of consent conditions inevitable. Serious breaches unrelated to heavy rain are very rare. It may be noted that in heavy rainfall, the stormwater flows in sewage and receiving waters compensate to some extent for the reduced quality of effluent discharged by providing rapid dilution of contaminants.

Council does not, however, minimise its responsibility for the effects and takes all breaches seriously, reporting them as required to Waikato Regional Council. Council has undertaken house inspections in Tīrau and Putāruru looking for direct inspections of downpipes into the sewer system. Council will extend these inspections in Tokoroa as well as carrying out smoke tests on the council reticulation to identify faults.

4.3.4 Level of Service Constraints

Other levels of service that may be constrained by asset configurations are:

- Ability to service properties where reticulation does not extend to the land in question, or the land is lower than the existing public sewers.
- Residential development adjacent to treatment plants may be exposed to noise and odour nuisances.
- As treatment technologies age and change, existing plants may need modification to treat an ever-increasing range of contaminants and to meet improved conditions of consent.

4.4 Council's Service Level Goals

Council has adopted a series of measures which are intended to indicate how well Council's services contribute to the community's desired outcomes. Both Customer Service Levels and Technical Standards are used.

This AMP has been prepared on the basis of a wastewater collection provision to the area broadly corresponding to the residential and commercial/industrial areas shown in the current district plan.

Generally, the expected level of service is being provided however there are some areas where the performance of existing assets will need to be improved to mee the current level of service.

4.4.1 Service Levels

The following table lists the current Levels of Service and performance measures.

Table 4.4 Wastewater Levels of Service

Community Outcomes (Ref 2015 LTP p83, two in total)	Council Strategies (Ref 2015 LTP p83, two in total)	Performance measures / KPI stated in 2012 LTP	Government's Mandatory Non-Financial Performance Measures (Gazetted Dec 2013)	New LOS (Ref 2015 LTP p84, five in total)
Sustainable Council operations: We have regard to sustainability while operating in a cost-effective manner**.**	Efficient and effective operations strategy: Sustainability is embedded in all of Councils operations.	No more than one break or blockage per year causing overflow, per 10 km of Council's sewerage pipe network. The network comprises 163.9 km of reticulation pipelines, so the KPI is for 16 or fewer breaks or blockages per annum.	System adequacy and maintenance: The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	The total number of dry weather overflows from the sewerage system shall not exceed 3 per 1,000 sewerage connections to the sewerage system. A dry weather overflow is when a blockage causes wastewater in the reticulated system to spill.
		There will be no "Formal Enforcement Actions" from the consenting authority (Waikato Regional Council) in regard to Council's compliance with resource consent conditions relating to wastewater.	Discharge compliance: Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders, and (d) convictions, received by the territorial authority in relation those resource consents.	There will be no "Formal Enforcement Actions" from the consenting authority (Waikato Regional Council) in regard to Council's compliance with resource consent conditions relating to wastewater.

Community Outcomes (Ref 2015 LTP p83, two in total)	Council Strategies (Ref 2015 LTP p83, two in total)	Performance measures / KPI stated in 2012 LTP	Government's Mandatory Non-Financial Performance Measures (Gazetted Dec 2013)	New LOS (Ref 2015 LTP p84, five in total)
Well Managed infrastructure: Our infrastructure is financially and operationally sustainable; it contributes positively to our district environment; and it is cost effective for households and businesses, now and in the future	Efficient and effective operations strategy: provide total asset management planning	At least 95% of urgent service requests are responded to within one hour of the request with the remaining 5% responded to within 24 hours.	Fault response times: Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured: (a) attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site, and (b) resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.	The median response times for callouts in response to a fault or interruption to Council's wastewater reticulation system does not exceed one hour of notice.
			As above	The median time to clear blockages or faults to Council's wastewater reticulation network will not exceed 24 hours from notification.
			Customer satisfaction The total number of complaints received by the territorial authority about any of the following: (a) sewage odour (b) sewerage system faults (c) sewerage system blockages, and (d) the territorial authority's response to issues with its sewerage system, expressed per 1000 connections to the territorial authority's sewerage system.	The total number of complaints received by Council about wastewater issues (including sewage odour, sewerage system faults, sewerage system blockages and response times to issues with its sewerage system) does not exceed more than one complaint per 1000 connections.

Table 4.5 Wastewater Performance Metrics

Wastewater Performance	2017-2020			
Nature of Work	**17/18**	**18/19**	**19/20**	**20/21**
Tokoroa				
Callout's	19	32	51	127
Sewer/MH	11	13	23	7
Pump stations	7	18	33	53
WWTP	10	13	14	28
Other	7	5	1	30
Total	55	81	122	245
Putāruru				
Callout's	8	7	5	20
Sewer/MH	3	3	16s	8
Pump stations	2	7	7	14
WWTP	0	2	0	-
Other	5	5	0	2
Total	18	24	28	44
Tīrau				
Callout's	13	18	6	19
Sewer/MH	0	1	4	-
Pump stations	7	14	6	6
WWTP	0	0	0	10
Other	8	8	1	1
Total	**28**	**41**	**17**	38
Arapuni				
Callout's	1	3	0	-
Sewer/MH	0	0	0	-
Pump stations	0	3	0	-
WWTP	0	0	0	-
Other	1	0	0	5
Total	2	6	0	5

Service Level Gaps

Service level gaps arise where actual service levels "fall short" of customer expectations. To deal objectively with short falls requires a clear distinction to be made between perceived and technical levels of service.

Technical service level gaps require actual levels of service to be compared with desired levels. From this point changes can be made in contract agreements to "close the gap" between actual and expected levels of service.

Activities Affecting Service Levels

The overall level of service that a customer receives will depend on three broad classes of "experiences" with Council:

- Fixed asset functions such as pipes, treatment plants, buildings, and roads. These assets provide service attributes such as capacity and reliability through their inherent physical characteristics such as internal diameter, wall thickness and durability.
- “Front office functions” such as answering enquiries, repairing network defects, arranging new connections, or receipting cash sales. These are generally done on-demand (while the customer waits) and require a high level of customer contact.
- “Back-office functions” such as preventative maintenance, compiling invoices and receipting credit sales. These are generally done with minimal customer contact.

The homogeneous nature of Fixed Asset Service Levels

Service levels such as capacity and reliability that are derived from fixed asset characteristics tend to be homogeneous or “common standard”.

Due to the homogeneous nature of fixed asset service levels Council will usually derive service levels from Customer needs, or technical standards that reflect established Customer needs.

Funding Levels of Service

The customer usually pays for utility services on an average charge basis, Average charging inevitably means that some customers will be subsidising others. Typically, customers in high density areas will be subsidising those in low density areas. Combining this with the “common good” nature of service levels means customers are unlikely to ever receive and pay for exactly what they want. This ideal situation is when the service is charged for on a metered or measured “user pays” basis, i.e., each customer pays a fixed connection charge based on the maximum capacity available to them, plus a variable charge based on the quantity used.

4.4.2 Customer Levels of Service

These service levels may include qualitative statements.

The challenge for Council is three-fold:

- To accurately translate perceived service levels into scientifically repeatable and measurable technical levels
- To implement those technical levels through robust asset management processes
- To report over time the measurable service levels that have in fact been achieved

Furthermore, Council must do these three activities within an acceptable funding envelope.

Quantitative service levels that may be expressed in terms of the customers’ requirements can include:

- Reliability - When people connected to Council’s wastewater system flush the toilet or pull the plug out of the sink, they expect the waste to just disappear.
- Cost - Tokoroa, Putāruru, Tirau, and Arapuni users currently pay a fixed annual charge **of $504.40** incl GST (2021/22).

4.4.3 Technical Measures

These measures are almost always quantitative. For example, the quality of water downstream of a sewage treatment plant may be measured by testing for a range of organisms and chemicals and checking in-stream biological impacts.

4.4.4 Regulatory Levels of Service

Most Council service delivery is also subject to standards imposed by external (government) agencies such as the NZ Transport Agency, Ministry of Health/District Health Board, Regional Council and Council itself through its District Plan requirements.

The Resource Consents for all Council's wastewater treatment plants include strict limits on both the volume and effluent standards. Extensive monitoring arrangements are in place to ensure that consent conditions are tested and reported to Waikato Regional Council.

4.4.5 Balancing Conflicting Needs

Council recognises the fundamental conflict between both environmental and public health requirements, and the willingness and ability of communities to fund the reticulation and treatment that will comply with these requirements.

Waikato Regional Council uses the Regional Policy Statement as a basis for determining the quality outcomes that Council must create. The Waikato Regional Policy Statement (Te Tauākī Kaupapa here ā-Rohe), or RPS, is a mandatory document that provides an overview of the resource management issues in the Waikato region, and the ways in which integrated management of the region's natural and physical resources will be achieved. It provides policies and a range of methods to achieve integrated outcomes for the region across resources, jurisdictional boundaries and agency functions, and guides development of sub-ordinate plans (regional as well as district) and consideration of resource consents.

Ensuring consent compliance and demonstrating that Council is a responsible user of waterways will be a key factor in allocating funds between competing needs.

4.4.6 Role of Private Assets

Fonterra operates a large private wastewater treatment plant at Tirau immediately east of Council's plant. The effect of this on Council's service is that:

- Industrial demand, including processing peaks, does not impact on the scale and capacity required to service the community, enabling Council's plant to be smaller
- Discharges from the public and private plants both affect the receiving water and the individual effect of one plant may not be apparent

5 Growth And Demand

This section sets out the factors impacting on the management and development of the assets to meet the requirements of growth and other demands place on the wastewater assets as follows:

- Growth trends, increasing industrial and residential growth in the District
- Land-use strategies (residential, industrial, retail and rural-residential).
- Changes in Regional policies i.e., Healthy Rivers
- Consumption and use patterns.
- Future demand for treatment of wastewater driven by technological changes
- Demand management strategies; and
- Climate change impacts on demand.

The latest 2018 Census data has revealed the District having an estimated population of 24,900 in 2018 and 25,100 in 2019 which is just underr a 1% increase from 2018. The majority of the growth is anticipated to be in the north of the District focused on Tīrau and Putāruru. The individual results by ward are tabled below:

Table 5.1: Demand Census data by ward

Sex	Male		Female		Total Population			
Year on 30 June 2020	2018	2019	2018	2019	2018	2019	Difference	%
South Waikato District	12,400	12,500	12,500	12,600	24,900	25,100	200	+1%
Tirau ward	1,200	1,230	1,190	1,210	2,390	2,440	50	+2%
Putāruru ward	3,370	3,380	3,530	3,580	6,900	6,960	60	+1%
Tokoroa ward	7,800	7,850	7,750	7,800	15,550	15,650	100	+1%

5.1 Future Demand Drivers

Asset planning necessarily involves a long-term approach that takes account of many factors and must also align with Council's Long Term Plan projections.

In addition to the Asset Management Plans, the Local Government Amendment Act requires Council to develop a 30-Year Infrastructure Strategy that addresses key issues and identifies necessary investment in new or upgraded infrastructure, replacement of ageing infrastructure and related operations, and maintenance expenditure.

The Asset Management Plans comply with the Purpose of Local Government, stated in LGA 2012 as "to meet the current and future needs of communities for good quality local infrastructure, local public services and the performance of regulatory functions in a way that is most cost-effective for households and businesses".

Future demand drivers for reticulated wastewater services in the South Waikato District are outlined below:

- Climate change projections
  Healthy waterways
  The extent of stormwater entry into the wastewater system
- Demographic projections, including population growth/decline, age distribution and location
- Economic development projections
- Demand projections, including customer expectations and ability to pay. Conversely, demand management may help to reduce or delay expenditure on extensions and upgrades to infrastructure, extend useful service lives and also to reduce operation and maintenance costs

- Changes to land use (e.g., conversion from forestry to dairy production)
- Compliance with existing and projected legislation (e.g., drinking water standards, public health, and safety), national strategies (e.g., transportation and related funding provided) and regional strategies (e.g., higher standards regarding environmental effects)
- Agreed Levels of Service and projected changes thereto
- Replacement of ageing infrastructure prior to assumed failure, which would interrupt service delivery and incur related consequences and costs
- Ensuring sufficient capacity to cope with total demand and the variability of demand (e.g., peak usage for short periods)
- Managing demand appropriately to control costs and contribute to sustainable management of natural resources
- Efficient and effective service delivery mechanisms (e.g., contracting, shared services)
- Introduction of new technology, where appropriate, with higher performance and more cost effective
- Affordability for the community and the mechanisms for creating revenue
- Life cycle management, which aims to optimise expenditure throughout the operating life of the infrastructure, including provision, operation, maintenance, and disposal of assets (see Chapter 4)
- The concept of sustainability and cultural considerations (including Tangata whenua)
- Resilience or the ability to maintain service delivery by alternative means following a major disruptive event, such as power failure, earthquake, volcanic eruption, or flooding and to restore normal services as quickly as possible thereafter (see Chapter 5)
- National policy statements are issued by central government to provide direction to local government about how to carry out their responsibilities under the Resource Management Act 1991 when it comes to matters of national significance.
- Consideration of "non-asset based" alternatives (e.g., charging regimes that incentivise desired behaviour)
- Consideration of the impacts of COVID on the demand for wastewater services, as business and household usages change i.e., greater working from home

In addition to the above, infrastructure planning should allow a degree of flexibility to allow adaptation to changing and unforeseen circumstances.

5.1.1 National Policy Statement – Urban Development 2020

Under The National Policy Statement – Urban Development (NPS-UD) Council is considered a ‘Tier 3’ District and therefore must implement the majority of the matters within the NPS UD, this has some implications regarding our obligations to provide for growth in residential and business development. Apart from removing our ability to have rules for car parking, the following are the key requirements from the NPS UD that now apply to SWDC:

- Provide sufficient development capacity to meet demand for short, medium, and long term.

Sufficient means ‘plan enabled’, infrastructure ready, and feasible and reasonably expected to be realised for both residential and business land.

Plan enabled means:

- Short term (0-3 yrs.) – zoned in an operative plan
- Medium term – (3-10 yrs.) – zoned in an operative plan or proposed plan (plan change)
- Long term (10-30 yrs.) – zoned in an operative or proposed plan or identified in a formal council strategy.

Infrastructure ready means:

- Short term (0-3 yrs.) – adequate existing development capacity to support development
- Medium term (3-10 yrs.) – adequate existing development capacity or funding for adequate infrastructure in 10-year plan.
- Long term (10-30 yrs.) - existing or funded capacity in 10-year plan or development of the infrastructure to support required development capacity is identified in infrastructure strategy.

National Policy Statement – Freshwater Management 2020

The Freshwater NPS applies to the management of fresh water through a framework that considers and recognises Te Mana o te Wai as an integral part of freshwater management. It directs the content that regional councils, in consultation with their communities, must include in their regional plans. Regional plans tell resource users what is allowed in terms of things like water takes and discharges, and what will require a resource consent.

The implementation of this National Policy Statement will result in heightened expectation that Council achieves meaningful improvements in wastewater discharge quality.

National Environmental Standards for Freshwater

The National Environmental Standards for Freshwater 2020 (Freshwater NES) will set requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems. Anyone carrying out these activities will need to comply with the standards.

The standards are designed to:

- Protect existing inland and coastal wetlands
- Protect urban and rural streams from in-filling
- Ensure connectivity of fish habitat (fish passage)
- Set minimum requirements for feedlots and other stockholding areas (to take effect in winter of 2021)
- Improve poor practice intensive winter grazing of forage crops (to take effect in winter of 2021)
- Restrict further agricultural intensification until the end of 2024
- Limit the discharge of synthetic nitrogen fertiliser to land and require reporting of fertiliser use (to take effect in winter of 2021).

National Environmental Standard for Wastewater

The Ministry for the Environment is continuing its work to support improvements to regulatory arrangements for Three Waters infrastructure. This includes progressing the development of a proposed new National Environmental Standard for wastewater discharges and overflows, as signalled in the Action for Healthy Waterways discussion document of 2019.

5.2 Ensuring there is Sufficient Capacity

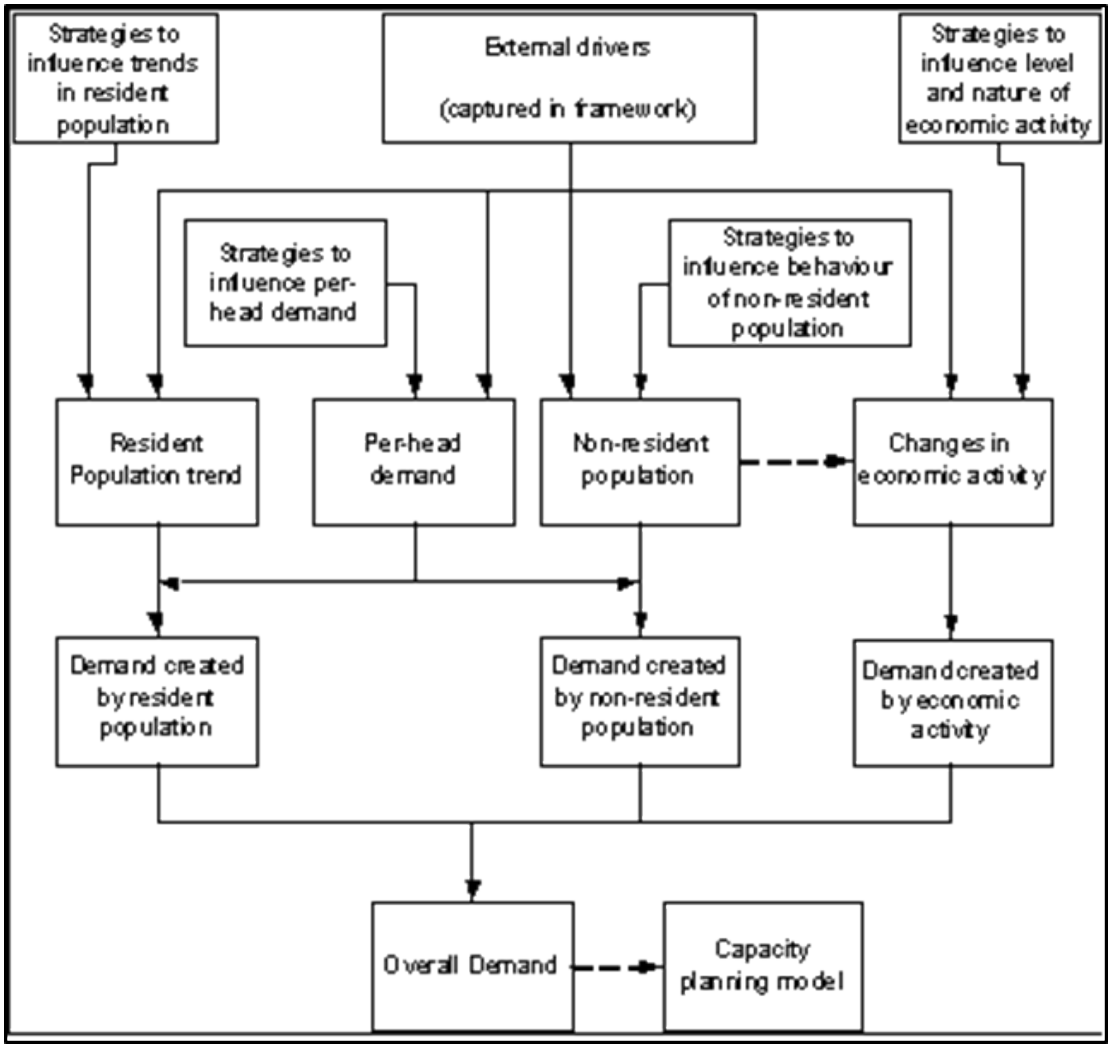


Figure 5.1 Demand strategy and planning process

Projected Flows & Loads

Projections of flows and loads arriving at the Councils WWTP's are summarised below. The projected flows and loads include contributions from industrial areas and proposed growth areas and are the projected loads in 2053 which is the expected duration of the proposed resource consents of 35 years.

Table 5.2 Demand of Wastewater projected flows

Year	Connected Population	ADWF (m^3/day)	PWWF (m^3/day)	CBOD (kg/day) Raw	TSS (kg/day) Raw	TKN (kg/day) Raw
Tokoroa	14,498[8]	4,177	4,634	258	64.5	641
Putāruru	6,687	1,129	1,860	209	206	56.3
Tirau	700	~~700~~ 309	359	-	-	-
Arapuni	300	~~300~~ 37	~~30971~~ 73			

[8] 2019 figures

Wastewater from Other Sources

Septage tankers collect waste from septic tanks and other sources and are only permitted to discharge to the wastewater system at the Tokoroa WWTP via a specially constructed receiving facility. Volumes discharged are low and typically comprises 2-4 m^3/week although the discharges are concentrated with high solids and organics concentrations.

5.2.1 Current Demand – Reticulation

Modelling of the wastewater networks has been undertaken in Tīrau, Tokoroa and Putāruru, several upgrades have been identified in the Putāruru network to accommodate future growth including upgrading of 430 m of gravity main between Arapuni Street and Tīrau Street to 300 mm dia. The wastewater reticulation networks have sufficient capacity in general. Average Dry Weather Flow (ADWF) and Average Wet Weather Flows (AWWF) are compared annually. Typical design values adopted nationally are for wet weather flows to be 2-3 times the design ADWF.

Illegal Connections/Inflow and Infiltration

It is estimated from variations in flows through the Tokoroa WWTP that stormwater makes up 20- 45% of total annual wastewater volumes in Tokoroa, and similar values are assumed for Putāruru and Tīrau, depending on the frequency and intensity of rainfall events. On-going investigations, including CCTV and property inspections, are occurring to attempt to better manage this issue although it is not expected that significant reductions in flows can be achieved.

In projecting future wastewater volumes, it has been assumed that the inflow and infiltration programmes currently underway will mean that inflow and infiltration will remain at current levels and not increase. Some further analysis of the possible reductions in levels of inflow and infiltration that might be achievable will be undertaken.

Infiltration/inflow investigations help to manage the numbers of illegal private storm water connections to the wastewater networks. These are undertaken when the ADWF/AWWF indicators shows them to be economic.

Pipelines Capacity

There are sections of the trunk sewer from the southern part of Tokoroa to the Treatment Plant, which has a very flat grade and are at capacity. A 1000 m length of the sewer between Fife Place and Clyde Street has been duplicated with a 300 mm diameter pipe to increase capacity in the upper catchment. Further sections in Arawa Crescent in Tokoroa have been identified as having a lack of capacity and should be upsized to 250 mm dia.

In December 2019, the South Waikato District Council (SWDC) commissioned Watershed Engineering Limited (WSE) to develop models of the Water Supply, Wastewater, and Stormwater networks in Tokoroa to support growth planning. Hydraulic models are an essential support tool for the planning and operational functions of the three waters networks for South Waikato District Council (SWDC).

Future Dry Weather Pipe Capacity has been assessed, with the current and ultimate (50 year) development scenarios. Rising mains were excluded for the assessment, as they are intended to operate in a surcharged state. The future scenarios show similar levels of network performance to the current situation. This is in part due to the small levels of anticipated growth, but also illustrates that the existing network operates very well under dry weather conditions and has sufficient capacity to accommodate growth. the length of surcharged pipe does increase from182 m to 776 m over the next 50years; however, these individual pipes would need to be surveyed to confirm the issue.

The capacity of the remaining network in Tokoroa is unknown currently, an investigation and modelling exercise has begun with the assistance of specialised consultants to determine the current capacity and any constraints in the wastewater network. Depending on the outcomes of this work, additional capacity upgrades may be indicated as being required.

With growth now projected for both Putāruru and Tīrau additional demands will be placed on the existing reticulation and several upgrades have been recommended following the earlier modelling work undertaken. The following projects are included in the future growth planning

Table 5.3 Project list to address Demand by community

Street	Location	Reasons
Arawa Crescent	Upgrade a 150 mm main to 250mm from Pukeko Place to Maraitai RD	Existing shortfall
Arapuni Rd	Upgrade 225 mm dia. main to 300 mm dia. between Arapuni Street & Tīrau Street required now.	Growth & existing Shortfall
SH1	Upgrade of gravity main downstream of Lorraine Moller Reserve to 375 mm. Required in 2037 to support growth.	Growth
Arapuni Rd	Upgrade 1,110 m of Grey Street Pump Station Rising Main to 200 mm	Growth
SH1	Upgrade gravity main along the Oraka Stream from 300 mm. Required in 2045 to support growth.	Growth

5.2.2 Current Demand & Capacity– Pump Stations

A number of pump stations have been identified as having a shortfall in both pumping capacity and in storage capacity. The modelling undertaken to date by Watershed[9] has indicated that several pump stations in Tokoroa, Tīrau, and Putāruru are below the required storage capacity, including Buckland St, Overdale St, Grey St and Depot St in Tīrau.

The study undertaken in Tokoroa suggested a review of Baird Road Station peak flow and upgrade, if necessary, to 90 l/s

- Increase storage capacity at Harris Road Pumping Station by 56 m^3 and Chartwell Pumping Station by 40 m^3
- Increase pumping rate at Bear Street Station to 10 l/s. However, there is still limited information at this site, and so further study is recommended for this site before proceeding, these are tabled below:

Table 5.4 Pump Station Demand storage capacities

Location	Additional Storage required	Reasons
Overdale Pump Station	39 m^3 additional storage	Growth & existing Shortfall
Buckland Street	12 m^3 of additional storage	Growth
Grey Street Pump Station	36 m^3 of additional storage	Growth
Depot Street Pump Station	72 m^3 of additional storage	Existing shortfall
Harris Pumping Station	86 m^3 of additional storage	Growth
Chartwell Pumping Station	54 m^3 of additional storage	Growth
Harris Rd Pump Station	56 m^3 of additional storage	Existing shortfall
Chartwell Pumping station	40 m^3 of additional storage	Existing shortfall

In addition, the following pump stations were identified as having either a current shortfall in pump capacity or a projected shortfall once growth is taken into account. Baird Rd WWPS has been assessed at 52 l/s

[9] Putāruru WW modelling calibration and Infrastructure report ECM478338

pumping capacity while the current 2-year ARI event flow is estimated as 65 /s in addition growth from the Thompson Street area will increase this to 70 l/s.[10]

Table 5.5 Pump Station Demand storage capacities with growth

Location	Additional pumping required	Reasons
Buckland St Pump Station	Increase to 10.5 l/s in 2029	Growth
Grey Street Pump Station	Increase to 25 l/s required 2020	Growth & existing shortfall
Baird Rd WW pump Station	Increase to 70 l/s	Growth & existing shortfall

All stations are fitted with electrical connections which allow for standby generators to be used when power is not available.

5.2.3 Projecting Future Demand

Council expects that the demand from existing sources of wastewater will generally not exceed capacity within the 10-year planning horizon.

In projecting future wastewater demand it has been assumed that:

- The discharge per head of population will reflect water usage patterns and will remain constant or decrease slightly
- Average dry weather flows will increase over the period of this AMP
- Current inflow and infiltration levels will not increase
- The proportion of major “wet” industries will not increase.

The following issues are identified as affecting demand:

Table 5.6 Issues Affecting Future Demand

Issue	Likely Effect
Removal of unauthorised storm water connections to the wastewater system	Reduce peak wet weather flows, and treatment costs
Pre-treatment of trade wastes	Reduce treatment costs, and environmental risks
Higher standards on effluent quality when consents are renewed	Volume demand remains the same, but higher standards mean additional treatment required and additional costs
Ageing population in urban areas	Neutral. Ageing populations generate less demand but will likely be balanced by future growth
Population Growth	Increase in water demand and consequent increase in wastewater flows, impacts will vary across the District
Gradual deterioration of network condition as assets age, causing pipe leaks, and underperforming plant	Deterioration without a balanced renewal programme will increase maintenance costs, and increase infiltration/inflow
Subdivision development	Increased wastewater flows may cause problems with under capacity sewers, and/or pumps

[10] Tokoroa 3 Waters Growth Cells Assessment Report ECM558640

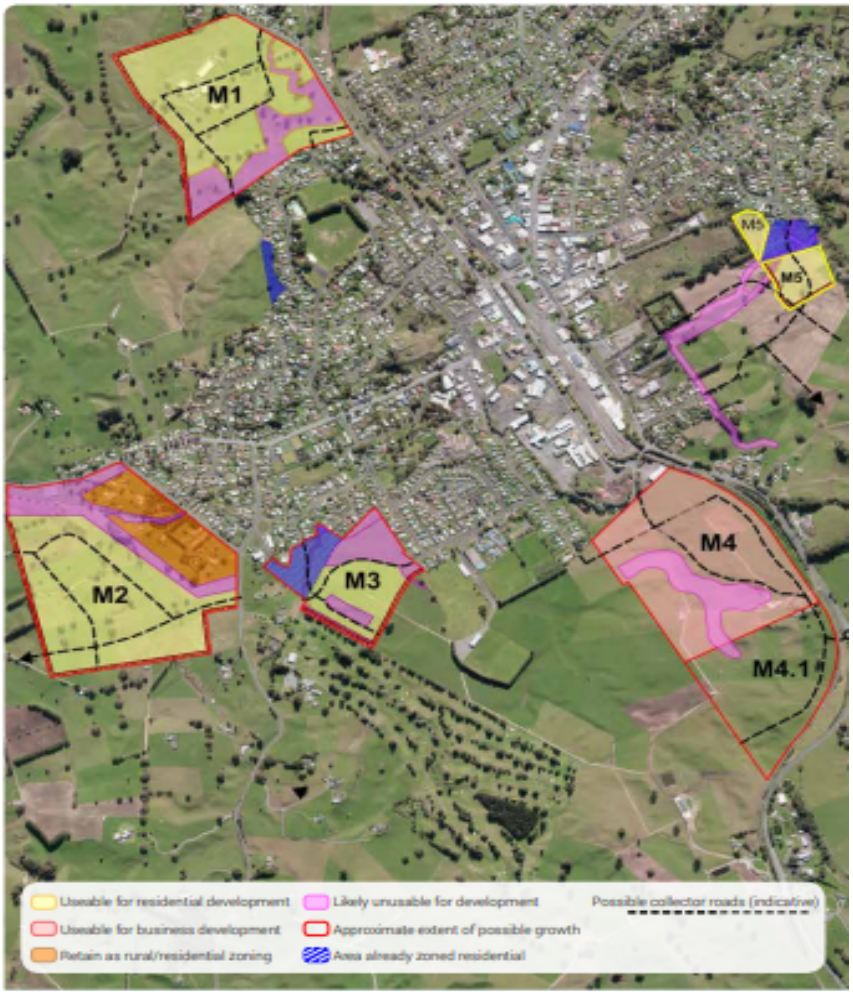
5.2.4 Residential Growth

To match the anticipated demand for new housing to the future supply of available housing in Putāruru, costed and serviced land, Council focused on selecting only some of the nine areas originally identified by the initial Growth Concept Plan and Putāruru Moving Forward workshops as seen in the plan below:

These areas have been selected to provide growth opportunities for the next ten years. Any development of these areas will also need to consider the possibility of future expansion beyond these extents.

Existing Land Supply

Putāruru, as shown highlighted in the adjacent aerial photograph, already has vacant, residential zoned land for possibly 45 new lots in the vicinity of Maple Drive and Ruru Crescent (greenfield sites) and approximately 150 sites capable of subdivision for smaller sections within the built-up residential areas (brownfield sites). However, there are a variety of constraints to some of these areas being developed for homes.



The growth scenario adopted for the town expects there to be about 20 new dwellings a year established over the foreseeable ten-year period. Once subdivided, Council anticipates that there will be a choice for homeowners when selecting an area of town to build in, so the land supply should exceed the expected demand for this reason.

Growth in Tokoroa is anticipated to be all within the currently zoned areas for the duration of this AMP period, the land zoned around Strathmore Park is currently being investigated as the next development area to include affordable homes and low-income homes. Future growth areas are currently under investigation, but this is still in its early stages, and will hopefully be available in time for the next LTP/AMP cycle.

5.2.5 Industrial Growth

Industrial growth is currently forecast to occur within the presently zoned areas of Tokoroa in particular the Maraetai Industrial estate and in Browning Street/ Hutloc Place. Industrial growth in Putāruru is currently planned in the growth cell M4 and only minimal industrial growth in Tirau in the Patetere Street Industrial Park.

5.2.6 Other Demand / Consumption Projections / Patterns

Wastewater Collection Services Demand/Wastewater Production Trends

The demand for wastewater collection services is dependent upon the volumes of wastewater produced and the extent of the collection service.

Changes to Water Use Pattern

With the exception of water used for irrigation and unaccounted for water, most water supplied by the South Waikato District Council water supply system is subsequently discharged into the wastewater reticulation. Changes in water consumption patterns are therefore likely to be reflected in corresponding changes in discharges to the wastewater system.

Domestic Water Demand

Domestic consumption trends are surveyed from a sample of metered properties that are manually read every quarter.

Population Projections

- Tokoroa 0.3%
- Putāruru 1.0%
- Tirau 1.0%
- Arapuni 1.0%

Future Population

After a long period of population decline, the district population now shows some growth up by 1% between 2017-2018. The increase was comprised of natural growth and 50% net migration. The major driver for migration has come from rising house prices in Auckland which has resulted in population movement to the region.

It is anticipated that population will continue to experience an increase over the next 30 years, providing an additional pool of ratepayers contributing to the cost of running and maintaining our infrastructure. However, the proportion of people aged 65 years or older is also expected to increase which means more people on fixed income who may have a limited ability to pay for rate increases. Older households typically use less water and hence have less demand on wastewater services.

In terms of demand for infrastructure, some needs of our community will change. Growth in the number of households will determine the demand for increased water and wastewater reticulation.

Demographic analysis and projections assist future planning by identifying likely trends in numbers and distribution of population. Domestic consumption trends can be analysed from the meter use records of those properties currently on a meter, this data can help with water use forecasts.

5.2.7 New Growth Projects 2022

In 2022 new development zones were approved for Tokoroa and Tirau (ref. Appendix F):

- Residential growth zones (Areas A, B, C, D) for 1124 residential units total, Tokoroa,
- Mixed business and residential growth Area E for 118 residential units with 35% yield on the total area of 16.2 ha, Tokoroa,
- Industrial Growth Area, 46.07 ha, Tokoroa,
- Residential growth zones (Areas A, B) for 229 residential units total, Tirau,
- Industrial Growth Areas A, B, C, total 42.85 ha, Tirau

The corresponding wastewater network capital improvements are rated as High Priority projects and are aimed to support growth and development by providing reticulation up to boundary of developable lands.

The wastewater component of Maraetai Road Intermodal Business Park (MRIPB) Stormwater and Watermain Improvements have been planned as a low priority project within financial years 2022/23 and 2023/24.

The above projects are proposed to be carried out in financial years 2022/23 and 2023/24 (ref. Section 8.2, 8.3, Appendices F2, G3).

5.2.8 Key issues include

Three Waters Reform

Significant reform has been proposed for the future management of the three waters. The Government is considering shifting the three waters management functions of councils to new multi-regional entities. If the reforms proceed, our role in managing three waters infrastructure will be significantly changed.

The Government has begun implementing a package of reforms to the three waters regulatory system, including the establishment of Taumata Arowai, the new Water Services Regulator. The service delivery model for water supply is likely to change in future. There is a lot of uncertainty about the impact of the Three Waters reform on water services activity while it remains our responsibility. However, it is likely that additional staff time may be required during this rapid transitional phase to become familiar with the requirements of the new regulator and the handover process.

In the meantime, we will continue to operate the Water Activity prudently as a going concern. We are well-placed to proactively respond to Three Waters Reform because of our early regional collaboration and signing of a Memorandum of Understanding with the Crown. It is likely that by the end of 2021 we will have decided on how we want to participate in the formation of a new water services entity.

Climate change

Climate change is likely to result in more extreme storm and drought events brought about by changes in rainfall, wind, and temperature. This will require Council to assess the effects of key climate influence on water, wastewater, and stormwater infrastructure.

The projected impacts of climate change are likely to become more noticeable towards the end of the planning period of this AMP, and have greatest relevance to water supply, wastewater, and stormwater assets.

The New Zealand Climate Change Office has released a report on the impacts of the changing climate in New Zealand which concludes:

- Higher temperatures, more in the North Island than the South (but still likely to be less than the global average).
- Rising sea levels.
- More frequent extreme weather events such as droughts (especially in the east of New Zealand) and floods.
- A change in rainfall patterns – higher rainfall in the west and less in the east.

Current research and monitoring suggest that the main impacts of climate change on the wastewater activity will be an increase in the frequency and intensity of rainfall events and hence potential increases in inflow & infiltration. This will require Council to continue to adopt an aggressive approach to identifying and reducing I&I if wastewater flows are not to exceed existing network and pump station capacity.

Natural Hazards

Natural Hazards such as earthquakes and volcanic eruptions have the potential to cause damage to our infrastructure but are unlikely to affect future demand patterns.

In terms of resilience, in the event of natural disaster Council has Standby generators on trailers that can be taken from site to site servicing the wastewater treatment plants and 18 wastewater pump stations as required.

Economic Activity trends

There are number of economic activity trends that have been recognised as having the potential to impose high and or seasonal demands on the infrastructure. For the purposes of this AMP, it has been assumed that economic activity will increase which will be reflected in the population growth forecasts highlighted elsewhere in this document.

Land Development

The impacts of proposed developments in Putāruru and Tirau have been modelled to measure the impacts on sewerage treatment both on site, and at Councils treatment facilities. From this modelling a number of

upgrades are proposed to both the reticulation and treatment plants to enable the wastewater infrastructure to cope with increased flows.

Increased sewage flows can be expected from developments of recent industrial subdivisions in Tokoroa including Braeside and Browning Street, Putāruru growth cell 4 (between Princess ST and SH1), and Tīrau communities during the planning period, as well as infill developments in Tīrau and Putāruru growth areas with some occurring in Tokoroa. Limited future growth is anticipated in Domain Rd in Putāruru.

5.2.9 Demand Analysis by Community

The following graphs show sewage flows from the treatment plants and compare the demand trends with the water supply demand in the same communities.

- Tokoroa wastewater volumes indicate a slower decline over the past 3 years with an upswing in volumes over the past 12-18 months. The average water use has remained constant over the last three years.
- Putāruru wastewater volumes indicate a levelling off in water consumption against a small decline in the previous 3-year period.
- Tirau wastewater and water volumes continue a steady decline over the 3-year period, while water use has continued to increase, recent modelling has indicated a large UAFW component in water demand patterns that requires further investigation
- Arapuni wastewater volumes have continued to show a small increase over the past 3 years, as well as in water consumption.

Storm water entry into the wastewater collection system, both through groundwater infiltration and through unauthorised storm water connections, is considered to pose a bigger issue than population growth of the system. Increasing frequency and intensity of rainfall is exacerbating this issue. Council will continue to fund targeted studies into inflow and infiltration.

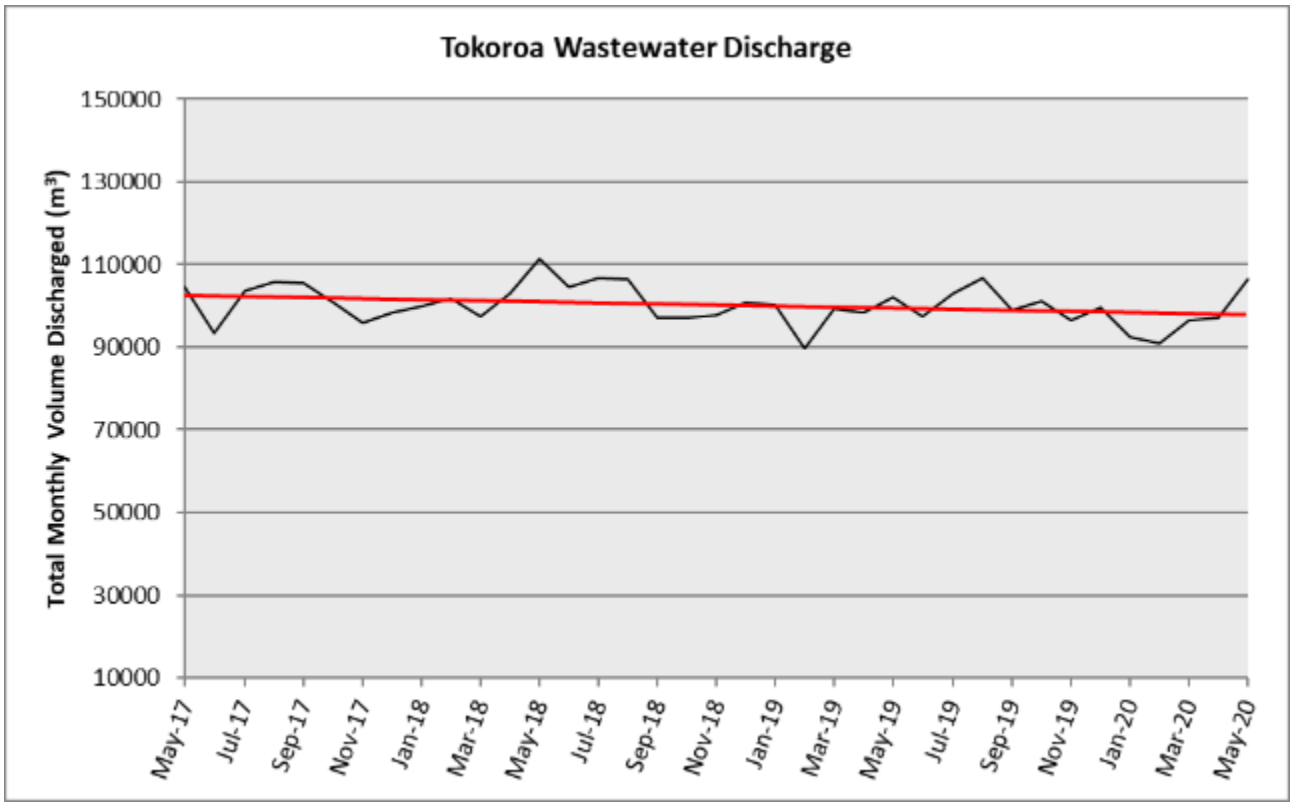


Figure 5.3 Monthly Wastewater Discharges Tokoroa

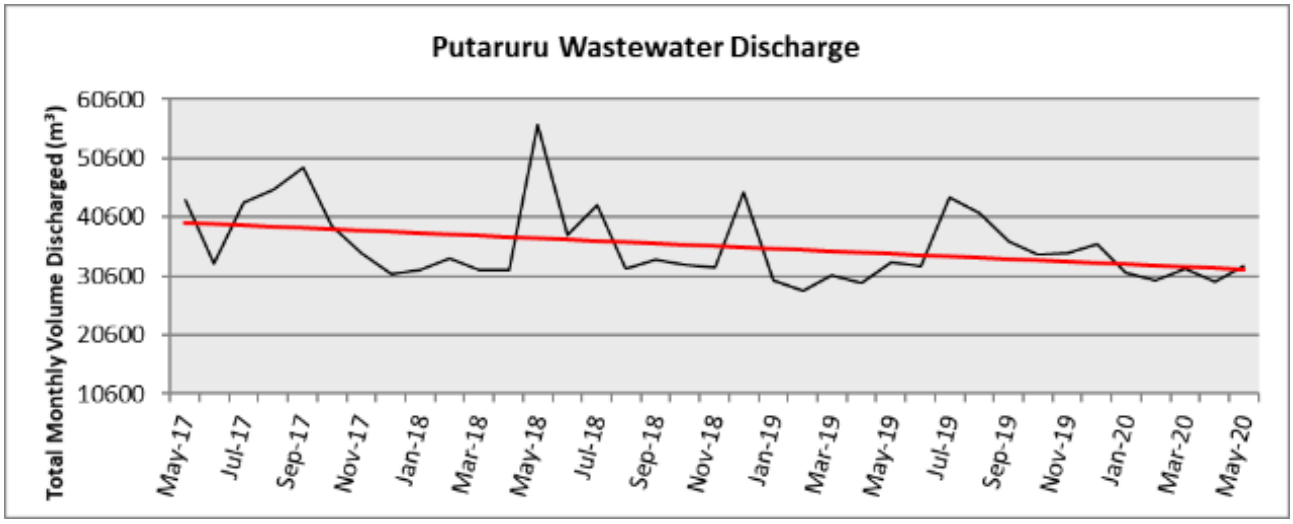


Figure 5.4 Monthly Wastewater Discharges Putāruru

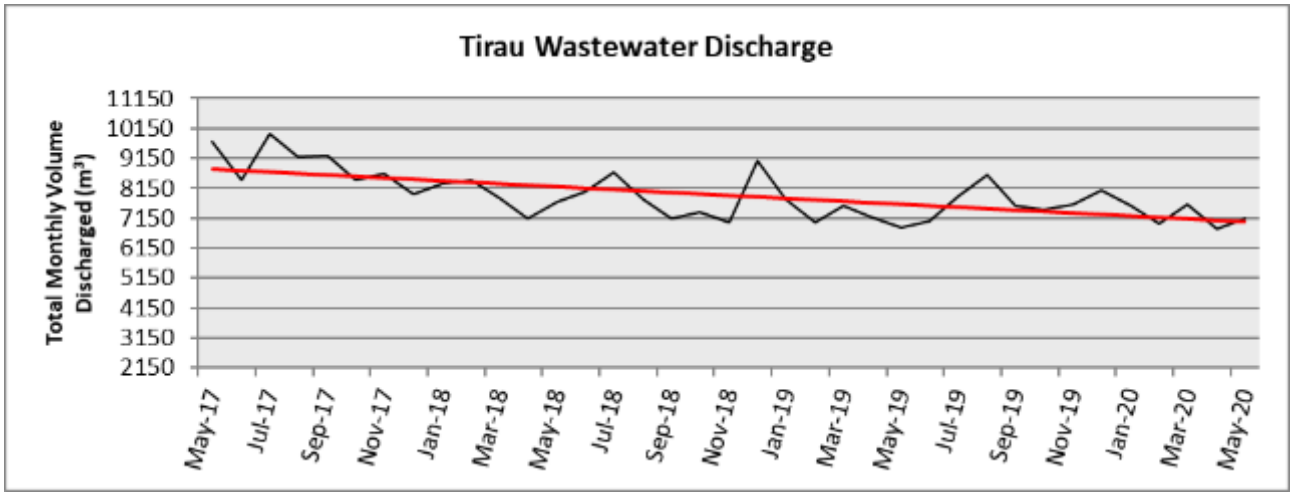


Figure 5. Monthly Wastewater Discharges Tirau

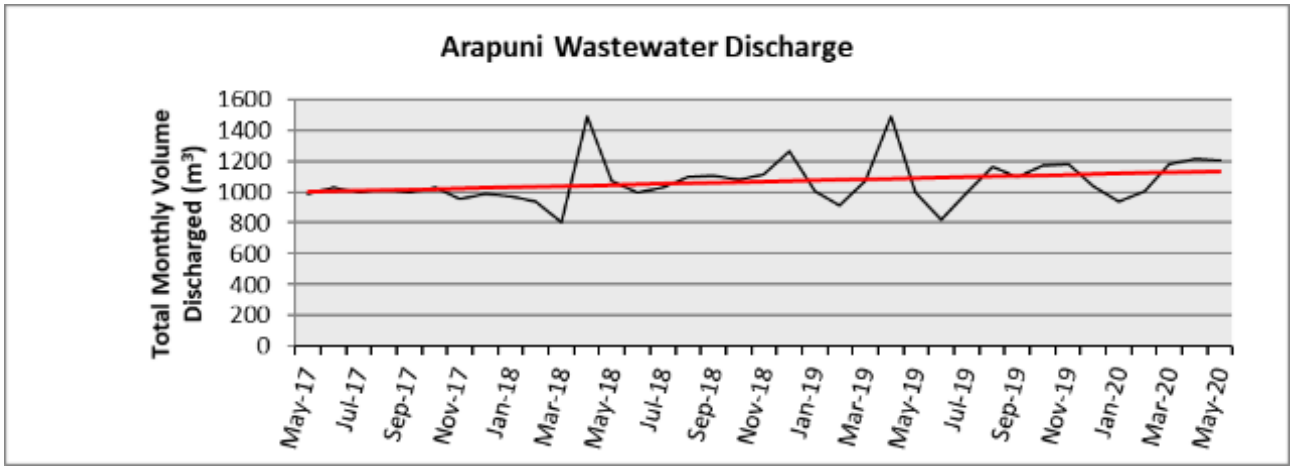


Figure 5.5 Monthly Wastewater Discharges Arapuni

5.2.10 Technology Trends

Technological advances in wastewater treatment and increased quality of effluent can be anticipated in future resource consent renewals. Council is unlikely to have discretion to ignore new technologies. These technologies are expected to be:

- Final stage polishing requirements that will increase over time to improve nutrient stripping of effluent, and disinfection. Council notes that this may well include additional chemical treatment and membrane technology
- More sustainable treatment and disposal of bio-solids.

Technology changes, such as composting or waterless toilets, are frequently touted as a means of decreasing water consumption and wastewater discharges. However, the uptake of these technologies is likely to be very low and health concerns also mitigate against their widespread adoption.

Low Pressure Sewer Systems (LPS) and potentially Vacuum Sewer Systems (VSS) have evolved and become a viable alternative for areas which are low lying, suffer from high groundwater levels and be susceptible to liquefaction in seismic events, all factors which make conventional gravity sewer systems less attractive.

An additional key advantage of the LPS systems is their provision of property level storage which provides a flow buffer resulting in significantly lower wastewater peaks and the options to hold back flows when the receiving network is at or over capacity. LPS are also very effective at restricting stormwater and ground

water infiltration given wastewater can only enter the house or property gravity network which is very limited in extent.

5.2.11 Demand Management Plan

Demand Management

Demand management is required in terms of resource consent conditions issued by the Waikato Regional Council, particularly to protect the allocation of physical resources.

Benefits of demand management:

- Increase confidence in the required capacity of infrastructure by reducing the need to "oversize" to meet short term peak requirements
- Operate the asset at its optimum performance efficiency
- Extend the operating life of the asset
- Optimise operational expenditure and effectiveness

Council is not involved in any direct manipulation of demand for either wastewater volume or content. Possible areas that council may consider are:

- Encouraging conservation of water usage which will reduce wastewater volumes.
- Requiring unauthorised stormwater connections into the wastewater system to be removed

Councils Trade Waste Bylaw, under which liquid waste inputs to the wastewater systems will be monitored and regulated over time is anticipated as having a net positive impact in terms of demand knowledge, reduction in pollutants reaching the stormwater systems, reduction in treatment required and more equitable charging for treatment of commercial wastes.

Council's Trade Waste Bylaw provides a regulatory mechanism for controlling the volume and strength of trade waste discharges. It allows for potentially large discharges to be controlled to reduce or avoid the impact of the discharge on the capacity of Council's wastewater collection, treatment, and disposal assets. The Trade Waste Bylaw is seen as the preferred mechanism for controlling volumes in different parts of the wastewater network in respect of any new and existing wet industries.

There is a need for additional work on demand management, identified in the 2009 Improvement Plan. Areas of investigation would include:

- Infiltration and Inflow (investigations are currently in progress)
- Water losses (water supply leakage, theft etc)
- Condition of networks
- Data integrity (control of data collection, recording and updating)
- Accuracy of metering equipment

5.3 Ensuring Future Service Levels are Adequate

Council recognises that future service levels are more likely to focus on content of the treated discharge rather than volume and expects to implement further nutrient stripping improvements as regulatory or cultural requirements arise.

It is expected that the following issues will be needed to be addressed within the planning horizon:

Table 5.7 Expected Issues with Future Service Levels

Location	Issues
Tokoroa	A new consent has been issued for the Tokoroa WWTP which will impose steadily increasing limits on nutrient volumes in the discharge over time. As a result of recent government funding the construction of a new denitrifying plant at Tokoroa has been brought forward into this AMP cycle to address those increased limits.
Putāruru	A new consent has been issued for Putāruru, ensuring the plant is run optimally before the 2026 upgrade is due will require additional effort by Council and close adherence to operation & maintenance plans.
Tīrau	A new consent has been issued for the Tīrau WWTP, ensuring ongoing compliance with the new conditions before the scheduled upgrade is due will require additional effort by Council and close adherence to operation & maintenance plans.
Arapuni	A new consent has been issued for the Arapuni WWTP. The condition of the pipe crossing the Waikato River needs to be assessed and flow monitoring installed to signal any breakages that may result in uncontrolled discharge to the Waikato River.

5.4 Future Service Level Requirements

In the next twenty years, Council anticipates changes to the level of service in the following areas:

- Changes to resource consent requirements will necessitate improvements to the wastewater treatment systems to improve the quality of the wastewater effluent discharge.
- In renewing critical assets, consideration will be given to increasing capacity, or providing duplication of the assets, to improve security of the wastewater collection system.
- Designation of specific growth areas within District particularly in Putāruru

These changes to levels of service have been allowed for in management of the wastewater assets.

Capital development programmes to meet projected changes in levels of service are set out and discussed in Section 6.

5.4.1 Resident Population Demand for Changes

Per-head volume demand is expected to increase if water consumption increases, although water demand management plans are in place. Treatment standard improvements will be required by Waikato Regional Council where treatment is currently at a basic level.

5.4.2 Externally Mandated Changes

Council expects that the required standards for effluent discharge in future resource consents issued by Waikato Regional Council will increase as new technologies emerge or in response to changing legislation and to meet the Healthy Rivers standards.

5.4.3 Changes Driven by Council Policy

Council's systematic investigation and removal of unauthorised storm water connections will decrease the required wastewater capacity.

Regulating trade wastes will have minimal effect on current service levels for the majority of customers, while requiring additional investment from the commercial customers. The expected results include protection of infrastructure from corrosive wastes, preservation of treatment plant capacity, reduced likelihood of breaching consent conditions and a small reduction in operating costs.

5.5 Climate Change

There has been considerable work undertaken at a national level on the possible effects of climate change and sea level rise. The New Zealand Government has published projections of climate change to 2080. The general projected trend in the published projections for the District is of winters being wetter and the other seasons being drier. More frequent and more intense rainfall events have been predicted. By 2090's the published projections show that in the Waikato region the typical temperature rise is expected to be up to +2.3 degrees Celsius and the region wetter by 20%.

The projected impacts of climate change are likely to become more noticeable towards the end of the current planning period, and have greatest relevance to Wastewater, Stormwater, and water assets.

The New Zealand Climate Change Office has released a report on the impacts of the changing climate in New Zealand which concluded:

- Higher temperatures, more in the north than in the south
- Rising sea levels
- More frequent extreme weather events such as droughts and floods
- A change in rainfall patterns – higher rainfall in the west and less in the east

The projected key climate influences on the Council's wastewater activity are detailed in the following table.

Table 5.8 Key Climate Influences on Council's Activities

Activity	Influences	Effects
Water Services	Changing weather patterns - Longer dry spells and higher temperatures will lead to more hot days during summer	Change in water usage patterns – higher water demands in summer
Wastewater Services	**Higher intensity rainfall events**	**More water inflow and infiltration into the wastewater system, with potential subsequent increases the risk of wet weather overflow events**
Stormwater	Higher intensity rainfall events	Increase stormwater inflow to the wastewater system Increased infrastructure capacity to cope with the increased rainfall intensity Increased risk of flooding
Emergency response/Rural Fire	Seasonal swings in moisture availability or excess	Increased exposure to fire and other weather-related matters has potential to increase costs to the community

Over time additional analysis is required to ascertain long term effects (if any) of climate change effects on Council's assets and service provision. To do this, more information will be required from Central and Regional Government. It is expected that the results of analysis will affect Council's policies relating to asset management and the AMPs. It is considered that improved design and design loading of new and replacement facilities will be an important part of Council's response.

In addition to planning a response to climate change effects, Council's Sustainability initiatives are intended to minimise the actions that are likely to contribute to further warming.

Current research and monitoring suggest that the main impacts of climate change on the wastewater activity will be an increase in the frequency and intensity of rainfall events and therefore an increase in inflow and infiltration. This will require council to adopt an aggressive approach to identifying and reducing I&I if wastewater flows are not to exceed existing network and pump station capacity.

6 Lifecycle Management Plan

6.1 Overview of Life Cycle Management

Lifecycle Asset Management aims to minimise the lifecycle cost in all AM strategies and practices associated with an asset or group of assets.

The Lifecycle Cost is the total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation, and disposal costs.

Typically, the greatest opportunity to influence the lifecycle costs and impacts of a project occurs before the assets are created. Once in place it can be costly to make substantial changes to the way it is managed.

Decision techniques include Benefit/Cost Analysis; Multi-Criteria Analysis and Risk-based evaluations or combinations of them.

6.2 Lifecycle Management Requirements

Council's strategic goals, customer requirements and external environment influences decisions about which activities are carried out and how they are best delivered.

The Asset Management Policy framework guides the priorities and sets out responsibilities, objectives, targets and plans for AM development.

6.3 Asset Development Planning

The development of asset infrastructure becomes necessary when a service deficiency has been identified. The solution may require the creation of a new asset or the replacement or renewal of existing assets, particularly if a "non-asset based' solution is not appropriate. In each case a project assessment is required to determine the amount of capital investment required.

In accounting terms, the capital expenditure assets are grouped into three categories, according to whether they satisfy (i) growth, or (ii) increased level of service, or (iii) renewal requirements. In some cases, the expenditure may address a combination of those requirements, particularly where there is an opportunity to introduce new technology or materials or processes.

The decisions on new asset projects will influence the long-term operating and maintenance costs and therefore the lifecycle costs of the infrastructure.

Determining the scope of the project includes considering the purpose of the project, estimated lifecycle costs, expected benefits, likely risks, funding arrangements and physical delivery. A range of options should be compared before selecting the preferred solution.

For some projects, a Business Case may be required in order to consider procurement strategies, commercial markets and funding mechanisms.

Where a number of projects is being considered, it is necessary to consider the timeframes and funding requirements, so that an implementation programme can be developed in an affordable manner, thereby avoiding peaks and troughs in expenditure and associated pressure on funds required.

6.4 Operations and Maintenance Planning

6.4.1 Operations

The assets are operated to deliver the agreed Levels of Service in an efficient and cost-effective manner.

Good operational management ensures that customers retain a high level of confidence in the service provided.

"Non-asset based" options are also taken into consideration with a view to delaying the need for creating additional assets, thereby providing economic and environmental gains. Demand management is a useful "non-asset based" approach that balances supply-side and demand-side measures.

- Supply- side measures focus on factors that result in capacity loss, such as water losses due to leaks and breakages.

- Demand-side measures consider how to influence and manage customer demand, such as through regulation, pricing, or incentives.

Demand management is typically driven by the following factors:

- Economic constraints (affordability)
- Environmental constraints (e.g., limited water resources, degradation of the environment, climate change impacts)
- Regulatory requirements imposed by resource consent conditions
- Organisational desire to demonstrate good citizenship
- Social pressures, such as the impact of asset development on community values

Demand management often focuses on reducing peak demand, which drives the required capacity of the infrastructure and related energy requirements. It is effective when the assets are operated close to full capacity, thereby delivering the maximum return on the investment. In addition, energy costs can be reduced by operating equipment during off peak periods when charges are lower.

Asset utilisation is monitored by various methods, including

- Load and performance measurement, such as flow and pressure variation in reticulation systems including diurnal and seasonal variations
- Energy consumption data
- Comparison of performance against levels of service
- Customer feedback
- Compliance with legislative or regulatory requirements

The monitoring data is used to review trend patterns that assist in planning future requirements.

Customer service requests are recorded and responded to in accordance with predetermined priority timeframes to ensure that the resources available are utilised efficiently and effectively.

6.4.2 Maintenance

Maintenance is essential to ensuring that the assets continue to perform at their intended level for service delivery; that they achieve their planned useful lives and those unexpected failures do not occur.

Lack of maintenance is likely to result in:

- Inefficient performance that increases operating costs
- Risk of service failure
- Consequent adverse effects (such as flooding)
- Accident or injury
- Breaching resource consent conditions and consequent prosecution. Where environmental degradation occurs, there is likely to be a requirement for additional monitoring and reporting to be carried out until the situation returns to normal. Public confidence in council's performance is reduced following such events.

Maintenance procedures include:

- Condition and Performance assessment
- Component replacement
- Cleaning
- Repairs
- Servicing
- Waste removal
- Recording of maintenance in the asset management system

Maintenance planning usually involves trade-off decisions in the following areas:

- Cost versus level of service and risk - prioritisation of maintenance
- Maintenance versus renewal - optimising when it is more cost-effective to replace rather than continue maintenance
- Planned versus unplanned maintenance - relates to the criticality of the asset and the timing of planned shutdowns during periods of low demand. The optimal balance between the two is achieved when the combined cost of the two regimes is minimised
- Efficient utilisation versus providing redundant capacity - the latter may assist in ensuring that the consequences of failure of critical assets are reduced

Most wastewater maintenance and operations are undertaken in house, by Councils Asset Unit, which operates water and wastewater in the District.

Trade Waste services has now been contracted out to WLASS with the staff based in Hamilton.

6.5 Capital Renewal and Replacement Planning

Infrastructure assets all have their particular useful lives, during which they are fit for the purpose of providing the required service reliably and effectively. When they are no longer capable of providing that service, a decision is required regarding continued operation of the service. The decision process addresses the following options for arriving at the optimal solution (i.e., the lowest lifecycle cost):

- Simple replacement of the asset (like for like)
- Providing additional capacity or performance (e.g., for growth)
- Refurbishment (e.g., relining the interior of a pipe)
- Introduction of new technology to replace old (e.g., solid state controls instead of mechanical/electrical)
- Disposal of the existing asset

In some cases, replacement is required before the useful life has ended, for example to cope with additional demand or to improve performance to ensure compliance with more stringent resource consent requirements or increased industry standards.

Renewal and replacement expenditure is a part of the overall capital expenditure process and should be considered whenever new assets are created or purchased, with a view to minimising lifecycle cost.

Renewal applies to works that replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability.

Replacement applies to complete replacement of assets that have reached the end of their useful life, so as to provide a similar, or agreed alternative, level of service.

6.5.1 Funding and Depreciation

The Depreciation account is based on the expected remaining useful life (which is determined and reviewed by condition and performance assessments and maintenance history) as well as the replacement cost (determined by triennial revaluations).

The account is funded from Council's rates, which are subject to review and acceptance at the political level, therefore the renewals and replacements programme must be carefully prepared to ensure that the agreed levels of service are maintained at an acceptable cost and risk from one year to the next.

Depreciation accounting was not introduced when the older assets were originally created, therefore the account does not adequately address the full cost of renewals and replacements, but it will significantly reduce the demand from other sources of funding, such as loans.

6.6 Disposal Planning

Disposal is a necessary part of the "whole of life" costing of assets and should be included in the planning of capital expenditure.

Assets may be disposed of for various reasons, including

- No longer fit for purpose due to poor condition or not suitably sized for the required performance as a result of increased demand or changed level of service
- No longer required because the intended purpose has changed (service discontinued)
- No longer able to be serviced due to lack of availability of spare parts
- No longer suitable as a result of decisions to standardise on brands or types of equipment
- No longer suitable as a result of changed manufacturing or performance standards or legislation

Options for managing disposal depend on the type of asset, for example

- A buried pipe may be abandoned in the ground or may provide a duct for inserting a replacement pipe
- A mechanical item may be taken into storage for use as spare parts or possible future use elsewhere (in which case it is no longer strictly a disposal item)
- An item may be suitable for use in a recycling programme, but may need to be disassembled into the various material components, e.g., metals and plastics
- An item may be sold at market value or given away
- An item may be taken to a solid waste landfill, if suitable for acceptance, in which case a disposal fee is incurred

6.7 Summary of Current Capacity

6.7.1 Networks

The capacities of the four communities' Wastewater pipe networks are generally adequate both in capacity, and condition. Extensive modelling of the wastewater networks has been undertaken in all three main urban centres. In Putāruru[11] under the current situation the majority of the pipework works well and is under 50% capacity during peak flows, the ultimate growth scenario shows no significant change in available capacity, although a section of pipe in lower Tirau Street is surcharged. Tirau has been assessed as operating within capacity and all current scenarios. There are a few relatively minor identified capacity constraints within the public sewer networks of Tokoroa and Putāruru only a section of the network in Arawa Crescent has been identified as surcharging under current conditions and requires further investigation. These are generally sections of pipe with flat grades which accumulate grit and other deposits, reducing capacity. They are identified in operational standards, and subject to regular cleaning as part of our maintenance and inspections contract.

6.7.2 Pump Stations

Most sewage pumping stations have twin pump sets with adequate pumping capacity to transfer sewage flows to gravity mains that are connected to the rest of the reticulation and to the Treatment Plants. The studies undertaken by Watershed have revealed a number of pump stations with either storage limitation or capacity constraints. The required storage capacity is determined by the RITS document which covers infrastructure in the greater Waikato, emergency generator plugs have been fitted at all stations for use when the power is out. Several of the issues in the Watershed report have already been addressed with additional storage installed at Overdale and Buckland WWPS, and new pumps and wet well-constructed at Grey St WWPS in Putāruru.

A new pump station has been identified as being required in Arapuni to service a new small development as well as an existing bowling club at 55 Arapuni Rd, these properties are currently serviced by an old septic tank which is under capacity and the disposal field is an unknown condition.

[11] ECM478338

6.7.3 Treatment Plants

Council's current wastewater treatment capacity is as follows (expressed in terms of equivalent residential connections unless otherwise stated):

Table 6.1 Treatment Plant Capacities by community

Town	Design Capacity	Current Demand		Surplus Capacity	Percent Population Increase that could be Accommodated
		Residential	Industrial*		
Tokoroa	15,000	12243	700	2,057	14%
Putāruru	5,000	3777	200	1,023	20%
Tīrau	1,000	693	50	257	25%
Arapuni	NA	322	Nil	NA	Not Known

*Industrial demand is expressed as an equivalent residential demand.

Tokoroa Design Capacity of the sludge digester allows for 24,000 population, but due to the tertiary treatment and UV capacity, 15,000 has been used for the Design Capacity. Closer examination of potential spare capacity should be considered as a future improvement.

- The above table indicates that, in general, a treatment over-capacity exists. The principal reason for over-capacity is population decline. Although the notional "design capacity" indicates surplus capacity, there are process limitations at each treatment plant which need to be considered as technologies, and consent expectations change with time.
- Previously, the physical limiting factor at Tokoroa was the capacity and operational efficiency of the anaerobic digester, this has been addressed with the commissioning of the new digester and associated plant.
- There will an increase in sludge production once we begin to remove Phosphorus in 2032. This has been addressed with the construction of the new digester.
- The hydraulic capacity of the Tokoroa WWTP is constrained with limitations present currently through both trickling filters, investigations are progressing into potential solutions
- The limitations at Putāruru are the age and condition of the bio-filters, and capacity of the UV disinfection system in addition the existing cold sludge digester is in very poor condition and no longer used as a consequence sludge is taken to Tokoroa for treatment.
- The limitations at Tirau are the primary screens and grit removal, and operations of the MBR
- Tirau inlet works consist of a single duty 3mm spiral screen (Huber Ro9/300/3) followed by a vortex grit removal system (Huber), the capacity of the inlet screen is 26 L/s while the capacity of the grit removal system is 17L/s. Proposed future flows are 45L/s [12]
- Tirau MBR plant has a hydraulic capacity of 360m³/day, based on the current ADWF of 309m³/day there is a surplus of 51m³/day available for growth.[13]
- The limitations at Arapuni are sludge production and the secondary treatment plant (Intermittent Sand Filters)and a new inlet screen and packaged treatment plant has been proposed.

6.7.4 Consents

Council's permitted discharge rates from its wastewater treatment plants are as follows:

[12] Tirau WWTP Capacity and Condition Assessment ECM615015

[13] Tirau WWTP Capacity and Condition Assessment ECM615015

Table 6.2 Discharge Consent Rates

Location	Consent Ref #	Permitted Discharge Rate	Expiry
Tokoroa	AUTH140055.01.01	To discharge up to 7000 m^3/day (wet weather flow) or 175 l/s at Q5 flows of treated wastewater to the Whakauru stream, and associated discharges to land and air.	1 September 2056
Putāruru	AUTH140126.01.01	To discharge 2,500 m^3/day of treated wastewater to the Oraka Stream, and associated discharges to land and air.	10 August 2055
Tirau	AUTH140124.01.01	To discharge up to 900 m^3/day of treated wastewater to the Oraka stream as well as associated discharge of odour.	10 August 2055
Arapuni	AUTH140049.01.01	To discharge up to 120 m^3/day of treated wastewater to land.	1 September 2056

6.7.5 Reticulation

Service Connections

There are 6,945 service connections recorded in the council's asset management system (effective 2021). These are typically 100 mm pipes. The material is not recorded in many cases, and the register shows the default material to be 'PVC'.

Pipes

Most of the reticulation systems are small diameter pipes which collect wastewater from residential premises and businesses and feed into trunk mains. The majority of the wastewater network has sufficient capacity with the exception of a local area at Balmoral/Aotea. The proportion of pipe material is shown below:

Table 6.3 Pipe Material by Scheme (in metres)

Material	Arapuni	Putāruru	Tirau	Tokoroa	Grand Total
AC-E	81	28	253	50,209	**50,570**
AC-F		1,205	6,521	59,410	**67,135**
AC-LINED-PVC		173			**173**
CLSWS				74	**74**
CONC	401	10,554		343	**11,298**
GEW	2,334		107	827	**3,268**
HDPE	124	271	521		**916**
MDPE	77		209	516	**802**
MPVC		18	381	735	**1,134**
PVC	382	657	218	1,069	**2,326**
PVC-HW				80	**80**
RC		22,330	154	4,002	**26,487**
STEEL		130	37	62	**229**
UPVC	734	1,579	817	1,535	**4,665**
Grand Total	**4,133**	**36,946**	**9,217**	**118,863**	**169,159**

As shown by the chart below, the asset register (AssetFinda) holds pipe material and size information which has been migrated from as-built and paper records. Materials used have changed over the years and some materials information is unclear.

AC-E and AC-F represent ‘Everite’ (imported) and ‘Fibrolite’ or other locally made fibre cement pipes. CLSWS and STEEL represent the small proportion of cement-lined and unlined steel pipes, typically rising mains from pump stations. CONC and RC both represent concrete pipes, and it is likely that most concrete pipes are in fact reinforced. The remaining materials encountered are GEW (glazed earthenware), HDPE (polyethylene), and various types of PVC.

The AC pipes of common sizes are shown ‘stacked’ in the chart due to scale and represent just over 70% of the asset group by length. Issues with these materials include softening due to age and to corrosion by sewer gases (e.g., hydrogen sulphide).

Table 6.4 Wastewater Reticulation Pipes by Size and Material

Material/ Diameter	32	50	80	90	100	150	200	225	250	300	375	450	525	725	Grand Total (m)
AC-E					426	42,398	2,132	3,442	814	1,330			27		50,570
AC-F					375	60,219	4,240	552	475		1,009	81	175	10	67,135
AC-LINED-PVC								173							173
CLSWS						74									74
CONC						7,162	1,586	1,479		692	379				11,298
GEW					611	2,657									3,268
HDPE				363	166	277			110						916
MDPE	77	284	139	39		209				53					802
MPVC			28		26	355				707	18				1,134
PVC			622		176	1,374				154					2,326
PVC-HW						80									80
RC					795	19,100	365	4,429		355	474	906	63		26,487
STEEL						24		42	37	38	88				229
UPVC					650	3,682	19	42		272					4,665
Grand Total	**77**	**284**	**789**	**403**	**3,225**	**137,613**	**8,342**	**10,159**	**1,436**	**3,601**	**1,968**	**988**	**265**	**10**	**169,159**

Age Distribution

The majority of pipes were installed in the 1960-1970 period as indicated in Figure 6.1 below (pipe install year). The AC – E type of pipe with an estimated renewal life of 80 years will be the main type of pipe requiring replacement over the next 20 years. The AC – F type of pipe has an estimated renewal life of 80 years, and this will not require replacement until approximately 2050-2055.

The total length of pipe requiring replacement over the next 30 years will be approximately 63 km, of these AC-E accounts for 50 km.

The timing of this replacement will be dependent on the criticality of the individual pipes (as detailed in Section 6.3.1) and the condition i.e., increased intervention will be required.

A condition assessment will be carried out on wastewater AC pipes in conjunction with water supply AC pipes during the term of this AMP to ensure SWDC have allowed correct estimations of remaining lives for funding purposes and replacement timing.

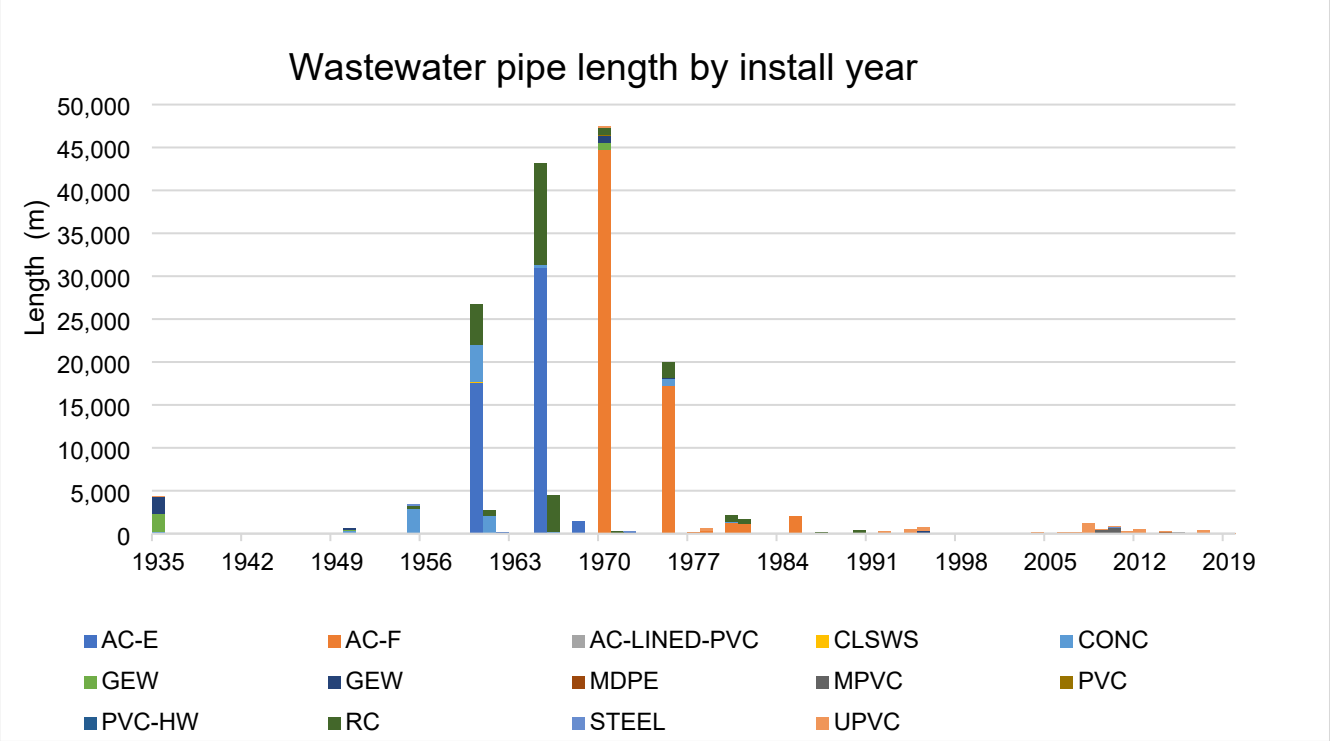


Figure 6.1 Pipe install year data different

Figure 6.2 below illustrates the post-war infrastructure expansion phase which is clearly visible in the centre of the chart. It can be seen that there are very few pipes over 60 years old, compared to the base life of 80 years that has been adopted. Further discussion is found in the renewals section of this chapter.

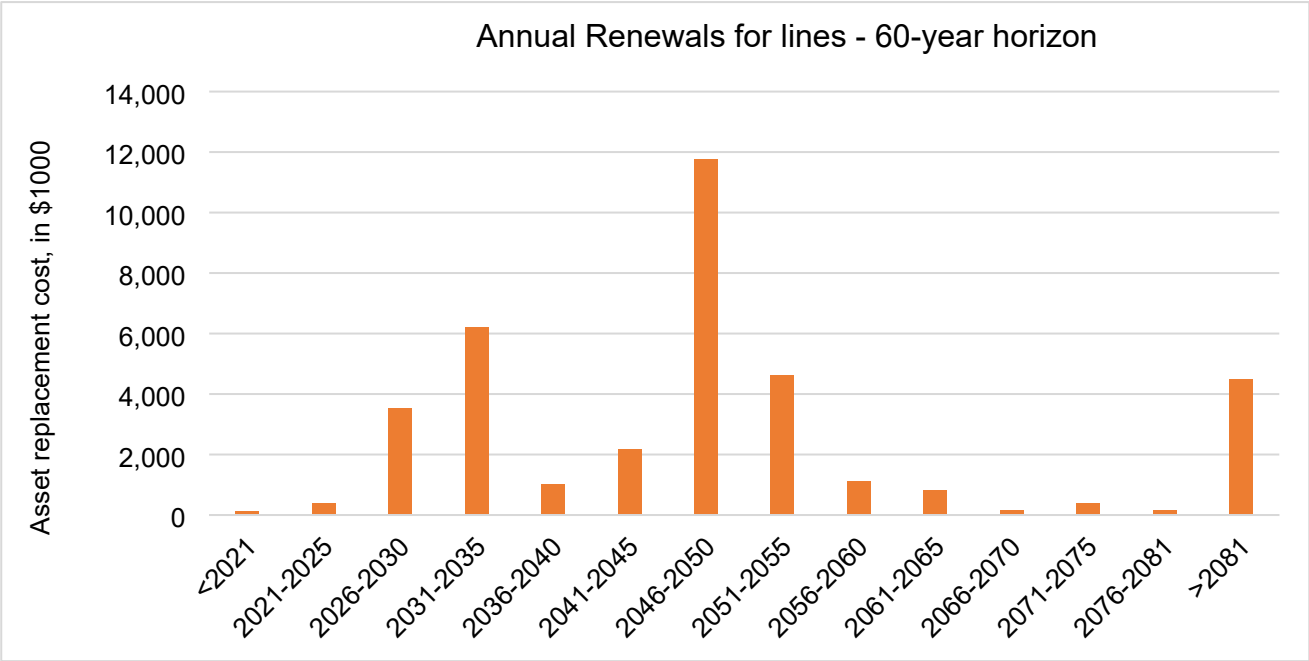


Figure 6.2 Wastewater pipes – projected renewals, 60-years horizon)

Manholes

Council's wastewater systems include 3,209 manholes. These are used at changes in pipeline grade, direction, or diameter or as collection points for multiple private service connections. They are generally constructed of circular reinforced pre-cast concrete sections founded on pre-cast or site-constructed concrete bases, with concrete benching (fairing) from inlet pipe/s to outlet pipe, to improve effluent flow.

Manhole lids, generally pre-cast reinforced concrete, span the manhole and provide support for the cast iron frames and circular cast iron access covers.

Deterioration may occur first at pipe entries and exits, since these represent weak points, or in the benching which must often be constructed or modified while the assets are in service.

Pump Stations

There are 18 pump stations serving Tokoroa, Putāruru and Tīrau, all of which are of reinforced concrete construction and housing twin pumps (duty and standby) except for Baird Rd (Tokoroa) which includes 3 pumps; and Sports Ground and Satco Drive Pump Stations (Tokoroa), which have single pumps. The pump stations are included within the definition of Plant for valuation and financial purposes.

The replacement cost of the pumping stations is $3.29 million in total, distributed as shown in the chart below.

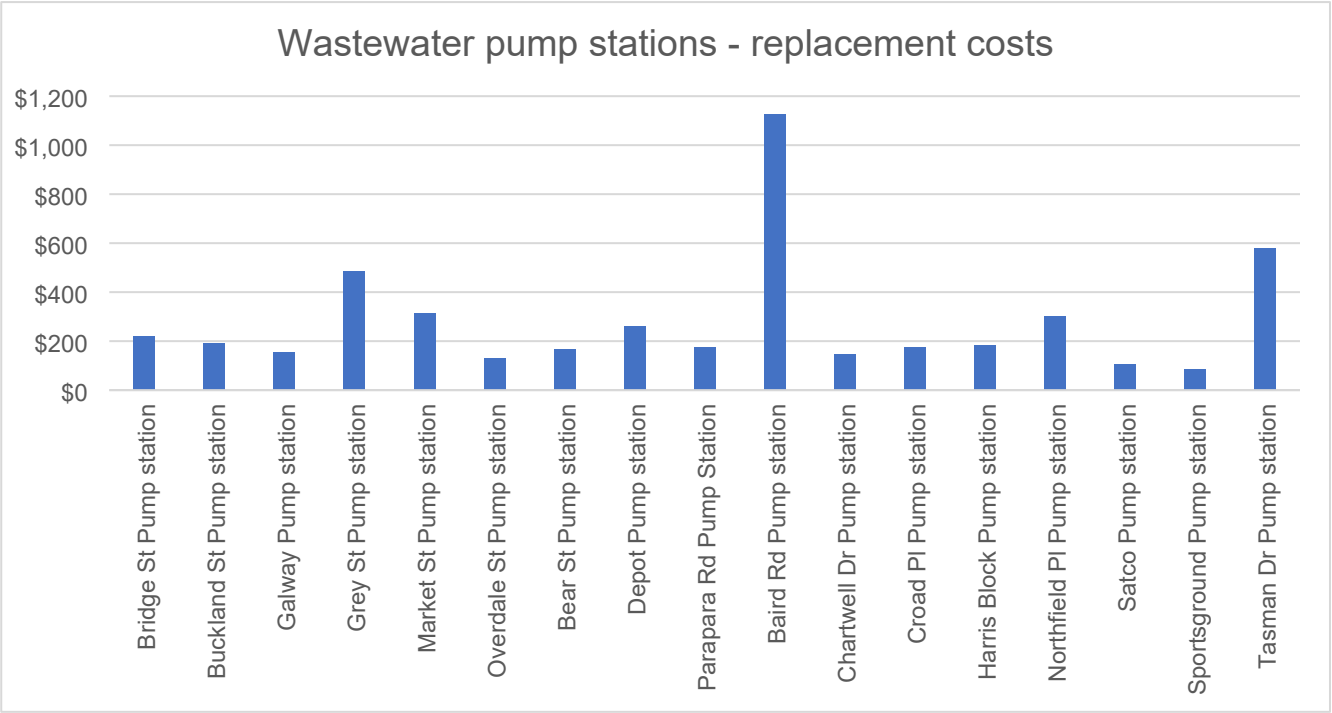


Figure 6.3 Pump station replacement cost, 2019

Sewage Treatment Plants

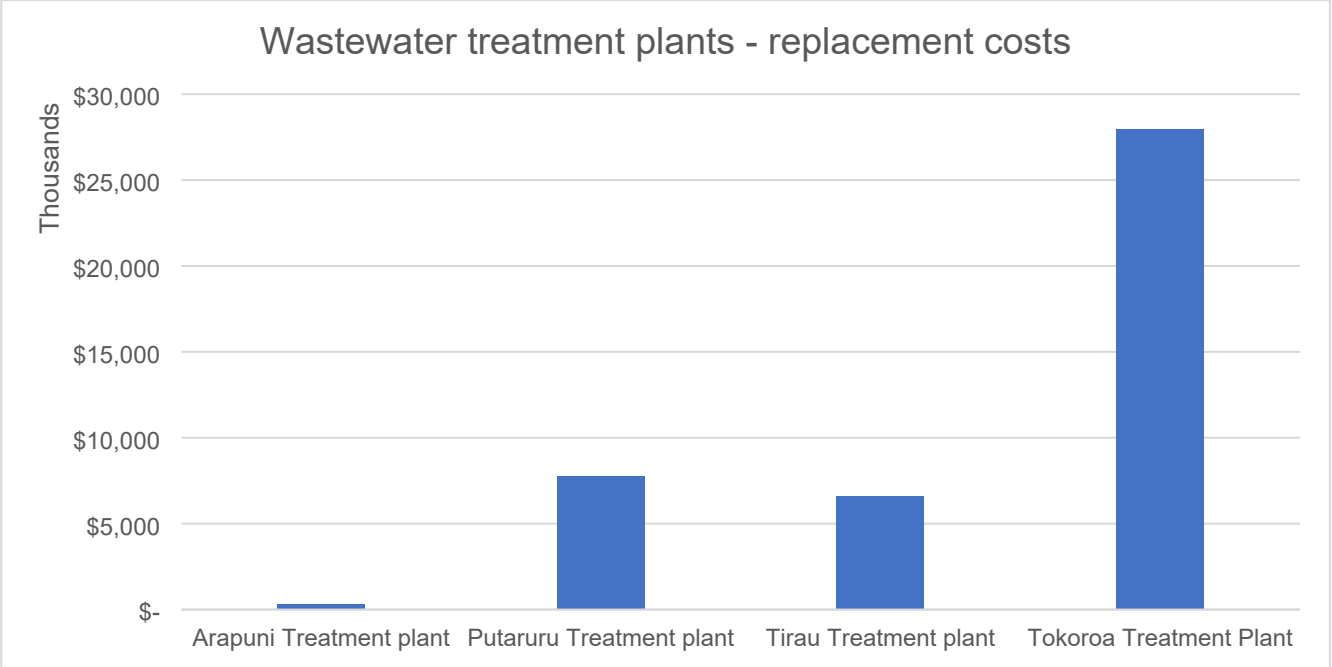


Figure 6.4 Treatment plant replacement costs, 2019

Council owns and operates four sewage treatment plants. These represent a significant proportion of the wastewater asset investment and virtually all of the current renewal expenditure, apart from pumping stations. The civil (structural) components are typically reinforced concrete and in good condition.

The mechanical and electrical components have shorter life expectancies due to their nature and service conditions. The replacement cost of the treatment plants is $29 million in total, distributed as shown in the chart above. $7.60 million of this value is related to tanks and structures, typically of reinforced concrete, which although depreciated at a rate of 1% per year, may in practice have an indefinite life.

The treatment plants are summarised as follows:


Tokoroa Wastewater Treatment Plant

- Tokoroa plant located adjacent to the Whakauru Stream. This plant was constructed in 1958 and has had four subsequent upgrades, the last of which included construction of a tertiary stage. This plant is Council's most comprehensive and includes pre-treatment, primary, secondary, tertiary treatment, UV disinfection, and sludge stabilisation stages
- Putāruru plant located adjacent to the Oraka Stream. This plant was constructed in 1955 and has had two subsequent upgrades. This plant includes primary, secondary treatment, microdrum filtration, UV disinfection, with limited sludge treatment
- Tīrau plant located adjacent to the Oraka Stream, which was commissioned in 1972 with a basic mechanised primary facility, and sludge drying. The plant was upgraded in 2006 with Membrane technology, the first operating wastewater MBR plant in New Zealand. Because most of Tīrau industrial wastewater is processed by a private plant on the Fonterra site immediately east of Council's plant, the wastewater treated by Council's plant is almost totally domestic sewage
- Arapuni is served by an Imhoff tank constructed during the 1950's. This plant provides only primary treatment, and functions like a large residential septic tank with limited sludge treatment. A rapid sand filter was added during the 1980s, and subsoil land disposal offsite

The discharge structures associated with Council's treatment plants are as follows:

- A rock filter into the Whakauru Stream from the Tokoroa plant
- A rock filter into the Oraka Stream from the Putāruru plant
- A rock filter into the Oraka Stream from the Tīrau plant
- Discharge from Arapuni is by an infiltration gallery into a sandy terrace on the west bank of the Waikato River

More information on these assets can be found in Appendix section 3 and Appendix A.

6.8 Maintenance and Operations Plan

The breakdown of operational costs below is based on historical trends and provides an indication of the OPEX split.

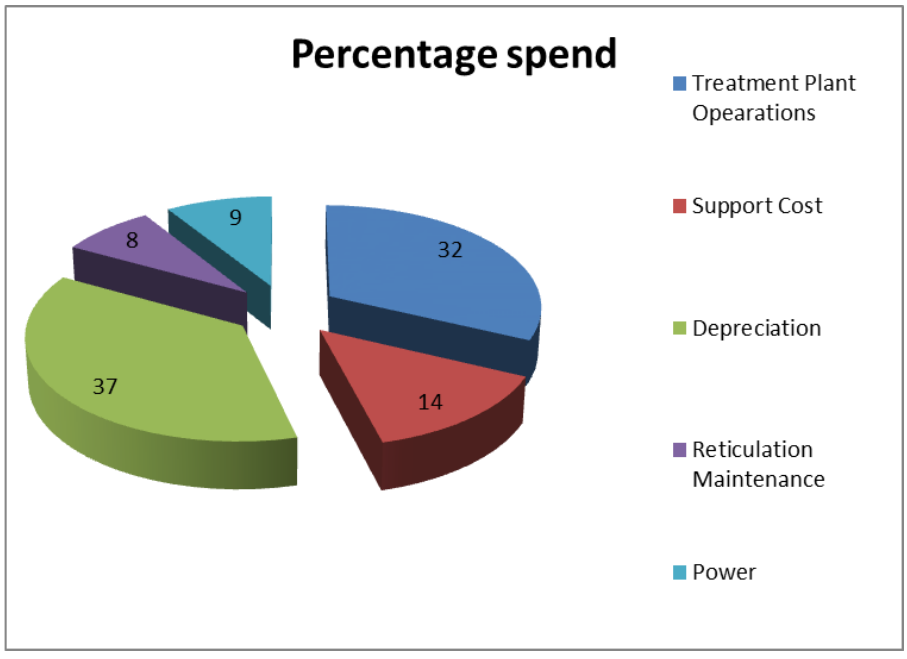


Figure 6.5 Maintenance and Operations

Wastewater Treatment Plant Operations Activities

The component costs of operating treatment plants can be summarised as in the figure below. Staff and Professional Services costs; finance, loans, and depreciation charges are not included.

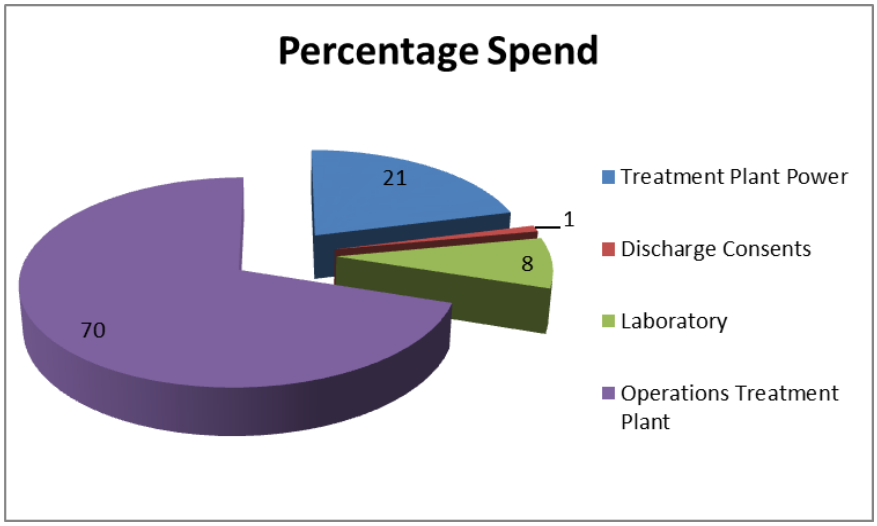


Figure 6.6 Treatment Plant Costs

Power costs for treatment plants are a major component and must remain at an on-demand tariff since it is not possible to operate the facilities off-peak. Power costs for pump stations are covered by the maintenance contract, with accounts going directly to the contractor.

Professional services, which include maintaining and developing asset inventories, standard specifications and drawings, project design, supervision, and management, are generally provided by Council services staff. When necessary, specialist assistance with Asset Planning, Network Modelling and Water Quality management is sought from external consultants.

Wastewater plants are operated, and assets are managed on a day-to-day level by the Infrastructure & Maintenance Unit through an annual internal service level agreement with the Assets Group. This includes provision of water quality sampling, with laboratory testing under subcontract.

6.8.1 Maintenance Activities

Council's wastewater assets are maintained and operated by our own in-house wastewater services team consisting of a Team Leader, leading hand, workshop foreman and seven wastewater operators/ technicians.

The general requirements of the "Level of Service" delivered by the assets team are:

- "To provide trained staff, plant and material resources to effect prompt and efficient routine maintenance of Council's sewerage systems
- To receive and treat sewage at each of the sewage treatment plants and monitor effluent water quality as specified
- To inspect, schedule and programme requirements described in the Agreement
- To execute the works to specification requirements in a safe, efficient, and timely manner that will enhance the Council's assets while minimising any inconvenience to asset users
- To maintain a close working relationship with Council's Assets Group to enhance the liaison process and ensure a good understanding of what is required"

Council continues to deliver the level of service required, and a low level of public complaints is a measure of the Unit's effectiveness.

Preventative maintenance, daily telemetry monitoring and regular reporting are carried out. Most operators including the team leader utilise Microsoft "Surface Pros" for recording compliance data via specialised software "Infrastructure Data" and for monitoring the council's wastewater network. A public requests or complaints are recorded in the Councils Service Request system (MagiQ) this records when the request

comes in, when it was responded to and when it was completed, these records are used for measuring performance against KPI's. Scheduled monthly meetings and reports are also used to advise problems, plan future activities and identify future works for longer term planning. Operations are optimised using these reports.

The overall performance of the assets is evident from the number of faults. Council has an improvement plan task to collect information on incidents, failures, and callouts by each of the four community areas.

6.8.2 Reticulation

Service Connections

Service connections remain the responsibility of the individual property owners and their rights and obligations are covered by the Councils Wastewater Private Mains Policy[14].

Pipes

Maintenance is a mixture of reactive and preventative actions:

- Blockages and breaks are repaired when reported
- Fault records are maintained via our service request system.
- Blockage overflow sites are inspected twice over a period of two weeks following the overflow incident to monitor their operation and general condition
- Preventative maintenance is carried out as follows:
  - Annual cleaning of about 18 sections of 'problem sewers' totalling about 3,500 metres is scheduled in the maintenance agreement
  - Six-monthly cleaning is scheduled for a further four lengths totalling 500 metres

The South Waikato District Council (SWDC) is conscious that it has little reliable information about the approximately 162 km of 'Gravity Pipes' that comprises the wastewater (WW) networks across the communities of Arapuni, Putāruru, Tirau, and Tokoroa. The network is captured in the GIS system in relation to its spatial location and connectivity and this is linked to asset attributes (diameter, material, age, condition, asset type, criticality etc.) in the Asset Management Information System (AMIS). In particular, SWDC has little information on the condition of the pipes, and hence their expected remaining useful life. This compromises SWDC's ability to manage the network, locate faults, undertake valuations, and plan for renewals

The obvious path to improving confidence and functionality is to inspect the network to confirm the asset attribute information. Some information is relatively easily and cheaply obtained from manhole inspections. However, information on the condition of pipes usually requires CCTV inspection and the cost of surveying the entire network could easily exceed $2.5 M allowing for manhole location, cleaning, CCTV inspection, traffic control, assessment, project management, etc.

For many of the smaller pipes this would not represent a 'value for money' or high priority investment as the potential consequences associated with the failure of such pipes are considered to be insignificant or low and able to be managed by normal maintenance procedures. Logically, Criticality can be used to structure and prioritise the inspection programme in two important ways:

- Assets with elevated criticality are inspected before assets with insignificant or low criticality
- All of the most critical assets should be inspected to ensure that SWDC is fully informed about them. A sampling approach can be used for assets with lower criticality to provide information on general trends for these assets which would inform future inspections and renewal programmes. Assets that have the lowest criticality, and/or are relatively new, might not be inspected until much later in their lives, if at all.

The following tables illustrate a proposed 5-year programme of approximately 4-5 km per year. It seeks a balance of risk and focuses on particular communities. The only group split occurs for Group 4 pipes in

[14] Wastewater Private Mains Policy ECM184080

Tokoroa that are split between years 4 and 5. Further details can be found in South Waikato Inspection Programme ECM550594.

Table 6.5 Community Total Inspection Programme breakdown over 5 years

Year 1		1	2	3	4	Rail	Road	High	Total
	Arapuni								3,806
	Putaruru	477				100	400	144	
	Tirau								
	Tokoroa	1,726				250	300	409	

Year 2		1	2	3	4	Rail	Road	High	
	Arapuni								4,785
	Putaruru		2,420	701	1,665				
	Tirau								
	Tokoroa								

Year 3		1	2	3	4	Rail	Road	High	
	Arapuni								3,662
	Putaruru								
	Tirau		26		512	150	350		
	Tokoroa		2,616	8					

Year 4		1	2	3	4	Rail	Road	High	
	Arapuni			901					3,901
	Putaruru								
	Tirau								
	Tokoroa				3,000				

Year 5		1	2	3	4	Rail	Road	High	
	Arapuni								5,037
	Putaruru								
	Tirau								
	Tokoroa				5,037				
Total Inspection Programme Over 5 Years									21,191

A new 3-year CCTV inspection and cleaning contract has been awarded covering this AMP period, in conjunction with the 5-year wastewater pipe inspection programme that has been developed this will be used to direct the annual inspection programme with the intention of inspecting 100% of our critical mains and 10% of the remaining network during this time.

This inspection programme will be the prime driver in identifying and refining our future renewals programme as well as assisting in identifying emerging trends in the condition of the wastewater network.

Manholes

Manholes are maintained along with the pipes. Occasionally it is necessary to locate and uncover or raise a manhole lid which has been lost and/or buried by private property owners.

Stormwater Infiltration

The ratio of wet to dry flows over time gives a measure of network and connection condition.

A typical benchmark for systems in Very Good Condition is a ratio of 2 x DWF. Modelling undertaken by Watershed over the past two years has shown minor overall I&I in Putāruru there are no uncontrolled wet weather overflows identified in Tokoroa while some areas of the Tirau network experience surcharging. Analysis of Council's four schemes produces the following results, based on peak daily flows divided by the low average (monthly) flow. The ratio of wet to dry weather flows has increased over recent years from the typical 2.2 to 3.5 up to 2.0 to 4.0 in recent years. This trend would indicate increased inflow/infiltration into the reticulation, and relatively high daily rainfall periods.

It should be noted that small schemes are likely to be "peakier" because of the reduced time of concentration inherent in small catchments. Arapuni results are higher as the flow meter is after the sand beds and includes the rain that falls on them. This meter will be moved to before the sand filters to give true readings for wastewater treated by the system.

6.8.3 Wastewater Pumping Stations

- Blockages and breakdowns are repaired when reported
- Fault records are maintained via our service request system
- Preventative maintenance is carried out as follows:
  - Baird Road, Tasman Drive: daily cleaning of screens and wet wells, and pump checks

- Grey Street, Overdale Road, Buckland Street, Sports ground, Northfield, Harris Downs, and Chartwell Drive: as above, three times a week
- Tīrau Stations, Oraka Reserve, Market Street, Bridge Street, Satco Drive, Croad Place: as above, twice a week
- All wastewater sites are now remotely monitored by telemetry, following an upgrade programme supported by the three waters DIA funding.
- All installed electrical plant and telemetry is checked in September and March
- All submersible pumps are lifted, cleaned, stator housing contamination checked, and oil replaced annually.

6.8.4 Wastewater Treatment Plants

- Blockages and breakdowns are repaired when reported
- Fault recording is now done using software supplied by Lutra (Infrastructure Data) for all interventions, Plant flows, effluent and receiving water quality monitoring, and reported monthly
- Additional “through plant” testing occurs to monitor plant performance
- Primary/skimmers, gravity and rising mains and digester eductor tubes are cleaned at least 6-monthly
- Pumps, valves, chambers, controls, mechanical devices, machines, and gas protection devices are maintained in accordance with manufacturer’s recommendations and best practice. All submersible pumps are cleaned, stator housings checked, and oil replaced annually.
- UV tubes, pH and D.O. probes are cleaned on a regular basis
- Dissolved Oxygen, pH, turbidity, and flow meters at all sites are calibrated as per the manufacturers’ recommendations.
- An Electrical Contractor undertakes formal maintenance checks on all installed electrical plant and equipment and the telemetry base at six monthly intervals in September and March including thermal monitoring to detect over heating circuits etc.
- Areas of mown grass around each plant are maintained by Council’s Parks contractor
- UV tubes at Tokoroa and Putāruru are replaced annually, and the ballast as required
- Tīrau WWTP membranes are checked annually, cleaned and any membranes that are damaged are replaced. Recent modifications have been made to the membrane frames to allow multiple membrane tubes to be replaced as a single unit.

6.8.5 Discharge Structures

The Tokoroa and Putāruru plant rock outfalls need regular maintenance to keep operational. It is planned to construct wetlands in Tokoroa, Putāruru, and Tirau over the coming AMP period which will result in the existing rock outfalls being abandoned and the outfall sites remediated.

6.9 Renewals

6.9.1 Overview

Asset renewal is major work which restores, rehabilitates, replaces, or renews an existing asset to extend its economic life and/or restore its service potential. Work over and above restoring an asset to its original capacity is classed as development work. Renewals may be carried out for two primary reasons:

- Maintain the asset service potential – this may be either the quality of service or reliability of service.
- Minimise the whole life cycle cost of the asset.

The decision to renew an asset will be based on:

- Criticality (consequence of failure).
- Condition (and therefore remaining useful life).
- Performance; and
- Value.

There are two options for a renewal project:

- Rehabilitate or refurbish the asset; or
- Replace the asset like for like.

Renewal literature often refers to renewals options to upgrade/downgrade or alter the asset to meet other service requirements. For the purpose of this AMP, this is considered development work.

The potential is recognised for extending the investment period of the depreciation reserves, so that cost to the community can be reduced in the long term due to growth in funds.

6.9.2 Renewal Strategies

Renewal decisions are made based on criticality, condition, and asset performance. Critical assets should not be allowed to fail, and programmes need to be organized to replace or renew critical asset prior to the expected failure date. Typically, assets maintain performance for most of their lifecycle and deteriorate quickly towards the end of their useful life.

Renewal of assets must be carefully considered, as early replacement leaves unused value in the ground, while delayed replacement causes loss of service and costly repairs. Overall performance of the network is carefully monitored to identify areas where renewals are required. Renewals can also be brought forward or delayed in some cases to co-ordinate with the road renewals/rehab program. The future renewal programme will be developed from the results of the current CCTV inspection programme.

6.9.3 Long Term Renewal Profile

The expected lives used for calculating the replacement year is shown following.

Table 6.6 Life Expectancy of Wastewater Assets and Pump Stations

Asset Type	Expected Asset Life
Wastewater Assets	
Wastewater Pipes	80 - 90
Wastewater Manhole	80
Wastewater Pump Stations	
Civil Structures	100
Pipework	80
Mechanical plant e.g., pumps	10 - 35
Electrical Equipment	15 - 25

Table 6.7 Life Expectancy of Wastewater Treatment Plants

Asset Type	Expected Asset Life (years)
Wastewater Treatment Plants	
Buildings & Civil Works	100
Electrical	15 - 25
Mechanical	10 - 30
Pipework	50
Electronic equipment e.g., analysers	15 - 25

These asset lives have been determined through standard asset lives as set out in the IPWEA NAMS manual Asset Valuation Guidelines and from our own inspection and condition records.

6.9.4 Reticulation

The figure below shows renewal works considered to be necessary during the plan period from the point of overall asset lives. The chart below shows that based on an average 80-year life the oldest pipes may require replacement within the planning period. There are sections of concrete pipe in Putāruru that have come to the end of their useful life before the predicted end of life based on straight line deterioration.

In the 2016/2017 year there were 18 blockages in the reticulation, which equates to 10.7 faults per 100 km. The older NZ networks report around 30 blockages per 100 km per year.

The renewal needs profile below is based on age and expected asset life and it does not account for actual asset condition and performance that can shorten the expected life of an asset.

The currently only identified wastewater pipe renewal is a section of 225 mm diameter main in Tirau Street Putāruru. This was inspected after a major trench collapse occurred opposite Neal Street, this revealed that the pipe was in very poor condition and hence it is scheduled to be relined in 2022/23.

Tokoroa

Following multiple failures and blockages along its length it is proposed to replace the existing wastewater pipe in Ferguson Street between TOK-KL-030 and TOK-KG-020, this is a 150mm AC pipe laid in 1965. Due to its location at the rear of the properties and the congested nature of the site it is recommended that this is replaced by pipe bursting and or pipe relining. This is an urgent project and should be programmed for the 2023/24 year.

The proposed budget for this is $300,000 and should be funded from the asset replacement reserve,

Future wastewater pipe renewals will be driven by the results of the current planned CCTV inspection programme as well as any unexpected failures or increases in blockages within the network. Those existing mains with a history of blockages will be prioritised.

In anticipation of the CCTV inspection programme SWDC have allocated up to $480,000 per year expenditure starting in 2023/24 for network renewals.

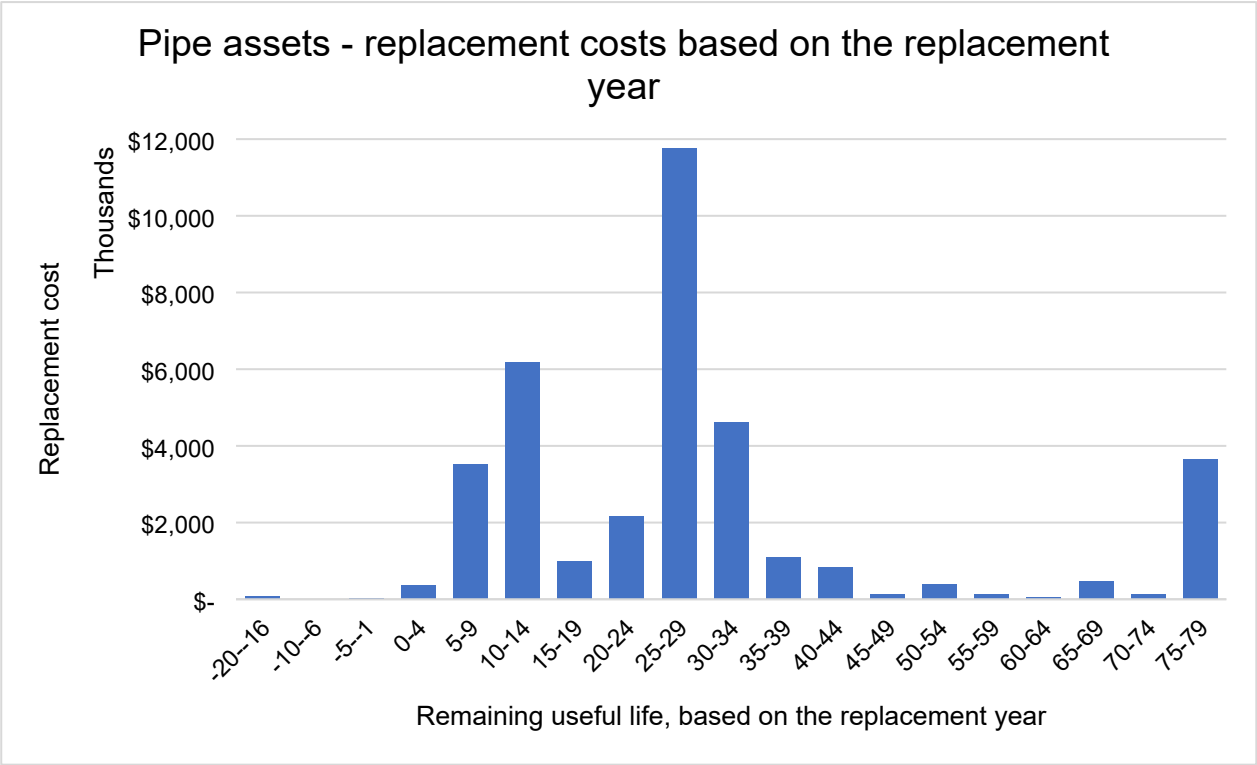


Figure 6.7 Wastewater Pipes – Projected Renewals Needs (60 Year Horizon) 2020

6.9.5 Pump Stations

The pump stations planned LTP forward renewal programme is summarised in Section 8 Financial Forecasts and detailed in Appendix G. This provides for the replacement of pumps, electrical switchboard, control systems including telemetry components, and provision of electrical connections for standby generators.

Consideration is given to “half-life” overhauls of pumps and motors, but it is recognised that in some cases it is more economical to replace units with completely new ones, because of the labour and material costs of an overhaul.

A number of growth-related renewals are planned in this AMP period including capacity increases (larger pumps) for Buckland Road and Baird Rd WWPS.

In addition, as a result of the modelling and investigation works undertaken by Watershed Engineering a number of storage upgrades are planned. The storage at all pump stations was originally assessed against the RITS standard which requires 9hrs storage at 2 x DWF. This was felt to be excessive in some instances and a lesser more usual industry accepted standard of 4 hrs at 2 x DWF was used.

The pump stations identified as having storage deficits are shown below:

Table 6.8 Pump stations with storage deficits

Location	Additional Storage required	Reasons
Overdale Pump Station	39 m^3 of additional storage	Growth & existing Shortfall
Buckland Street	12 m^3 of additional storage	Growth
Grey Street Pump Station	36 m^3 of additional storage	Growth
Depot Street Pump Station	72 m^3 of additional storage	Existing shortfall
Harris Pumping Station	86 m^3 of additional storage	Growth
Chartwell Pumping Station	54 m^3 of additional storage	Growth

The pump stations at Buckland and Overdale were addressed at the end of the previous AMP period and new storage was constructed in 2020/21.

In addition, the following pump stations were identified as having either a current shortfall in pump capacity or a projected shortfall once growth is taken into account. Baird Rd WWPS has been assessed at 52 l/s pumping capacity while the current 2-year ARI event flow is estimated as 65 /s in addition growth from the Thompson Street area will increase this to 70 l/s.[15]

Table 6.9 Pump stations with additional pumping required

Location	Additional pumping required	Reasons
Buckland St Pump Station	Increase to 10.5 l/s in 2029	Growth
Grey Street Pump Station	Increase to 25 l/s required 2020	Growth & existing shortfall
Baird Rd WW pump Station	Increase to 70 l/s	Growth & existing shortfall

6.9.6 Treatment Plants

The wastewater treatment plants renewal programme is summarised in Section 8 Financial Forecasts and detailed in Appendix G. This provides for renewal of mechanical and electrical components such as pumps, blowers, motors, ultraviolet lamps, control equipment, modular filtration screens, telemetry (SCADA), and membranes. Minor above and below-ground components such as dosing pumps, meters, valves, relays, and the like are replaced at of the yearly operational budgets.

The major capital costs in future are associated with the proposed treatment plant upgrades arising out of the Resource Consent renewals at the Tokoroa, Putāruru, Tirau, and Arapuni.

As a result of the DIA Three Waters funding programme the South Waikato District Council received $3.88 M to advance proposed upgrade works. As a result, we were able to bring forward the future denitrification plant and construction has begun with completion expected in 2022. This plant is a Moving Bed Bio Reactor plant (MBBR), and it is being retro fitted into the abandoned sand filters located post FAST system.

Provision has been made for improved primary screening and replacement of the intermittent sand filters at Arapuni. The Inlet screens to the Tokoroa WWTP were replaced with a bandscreen in 2021 to assist in the treatment process and after issues were identified in the performance of the anaerobic digester from large volumes of rags and other solids that were entering the plant.

Capacity constraints have been identified at Tirau regarding the inlet screen and grit removal systems, investigations have begun into suitable replacements and preparation of estimates, it is proposed to include a programme for replacement in the next LTP round. In addition it has been recommended that an additional 1mm fine screen is installed before the MBR in line with current best practice, this can be included in the overall inlet capacity upgrade project.

Following granting of the Tīrau and Putāruru WWTP discharge consents major upgrades are now planned for 2026 in Putāruru to reduce total Nitrogen and in Tīrau for 2035, budget has been provided in the LTP to cover investigations, designs, and construction of the upgrades at Putāruru as shown below:

Table 6.10 Putāruru treatment plant project upgrades

Project Phase	Budget Amount	Year
Investigations/designs	$275,000	2023/24
Construction	$6,480,000	2024/2026

An additional $125,000 in operational budget has been allowed for from 2026 to meet the additional operations and maintenance requirements for the upgraded plant.

[15] Tokoroa 3 Waters Growth Cells Assessment Report ECM558640

The proposed upgrades at Tirau fall outside of this AMP period, the RCs were granted on the basis that Putāruru would be upgraded first and the improvements in the discharge would be in excess of the minimum required thereby enabling the upgrades at Tirau to be deferred.

6.9.7 Discharge Structures

These passive assets are not generally required to be replaced, as discussed above as a requirement of the recent Resource Consents. Issued wetlands will now be required post UV treatment at Tokoroa, Putāruru and Tirau, with Tirau due to be constructed over the summer of 2021/22. As a result, the existing discharge structures will be removed, and the sites remediated.

These have the following budgets:

Table 6.11 Treatment Plant remediation budgets

Treatment Plant	Budget
Putāruru	[to be provided]
Tokoroa	[to be provided]

6.9.8 Forecast of Plant Asset Renewals Needs, Costs and Timing

Wastewater plant renewals needs in the planning period (above-ground items such as pumps, electrical equipment and associated valves) are shown on the following chart:

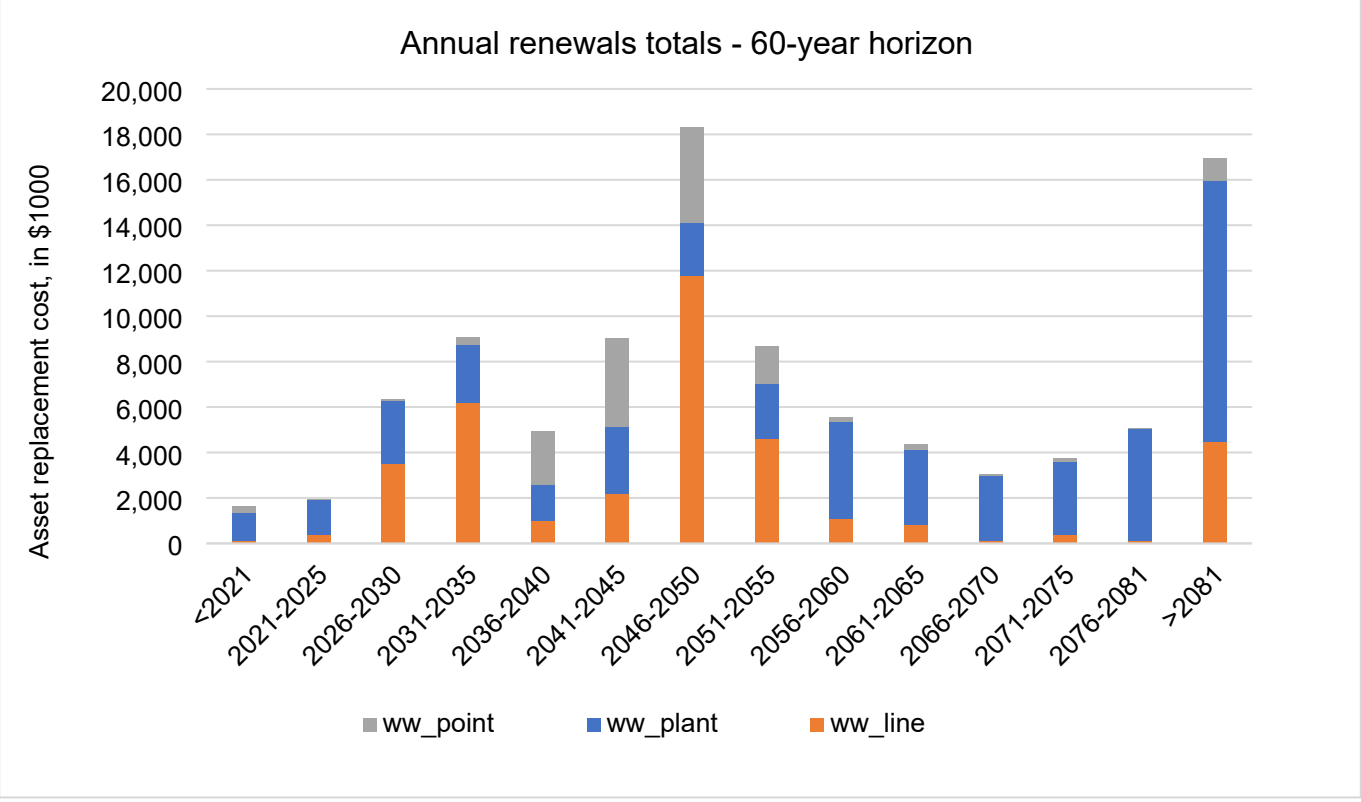


Figure 6.8 Forecast of Asset Renewals, Costs and Timing graph

The LTP budgeted financial forecasts for the next 10 years are shown in Appendix G.

6.10 New Works- Growth and Future Levels of Service

This section sets out the factors impacting on the management and development of the assets to meet the requirements of growth and other demands place on the wastewater assets as follows:

- Future demand drivers

- Growth projections
- Growth trends
- Land-use strategies (residential, industrial, retail and rural-residential)
- Consumption and use patterns
- Demand management strategies; and
- Climate change impacts on demand.

The future demand for reticulated wastewater services in the South Waikato District will be driven by:

- Residential and industrial growth in the District particularly in Putāruru
- Changes in water consumption and usage patterns. Most water supplied for domestic, commercial, and industrial purposes is subsequently discharged into the wastewater system
- Greater uptake of Low-Pressure Sewer
- The extent of stormwater entry to the wastewater system (infiltration and inflow)
- Future demand for treatment of wastewater driven by technology changes
- Regional Council Standards
- Government Regulations
- Climate change.

The planned LTP forward capital improvement programme is summarised in Section 8 Financial Forecasts and detailed in Appendix G.

Growth and Higher Environmental Standards

- The Regional Council and Iwi want a reduction of nutrient discharge from the Tokoroa, Putāruru, and Tirau Wastewater Plants. This is being addressed by the denitrification plant construction at Tokoroa and the proposed upgrades at Putāruru during this AMP period. Future phosphorus reductions are required at all three plants but those fall outside the current AMP planning period.
- The Arapuni Treatment Plant consent was renewed in in 2021 with only minimal improvements required, the Council does intend to upgrade the inlet screens from the current bar screens to a mechanical 3 mm screen.

6.10.1 Additional Proposed Level of Service projects

Tokoroa

Following multiple failures and blockages along its length it is proposed to replace the existing wastewater pipe in Ferguson Street between TOK-KL-030 and TOK-KG-020, this is a 150mm AC pipe laid in 1965. Due to its location at the rear of the properties and the congested nature of the site it is recommended that this is replaced by pipe bursting and or pipe relining. This is an urgent project and should be programmed for the 2023/24 year

The proposed budget for this is $300,000 and should be funded from the asset replacement reserve.

Figure 6.9 Proposed Tokoroa wastewater main replacement.

Arapuni

A new pump station is required to service a small development on the west side of the township at 55 – 57 Arapuni Rd including the bowling club. The properties are currently connected to an old septic tank and associated disposal field which is in a poor condition, in addition land disposal within an urban area is not best practice.

The recommended budget for this project is $350,000 to be loan funded and includes supply and installation of a pre-packaged pump station, installation of a 100mm dia rising main and electrical and mechanical site work. This is an urgent project due to the disposal field no longer functioning and should be

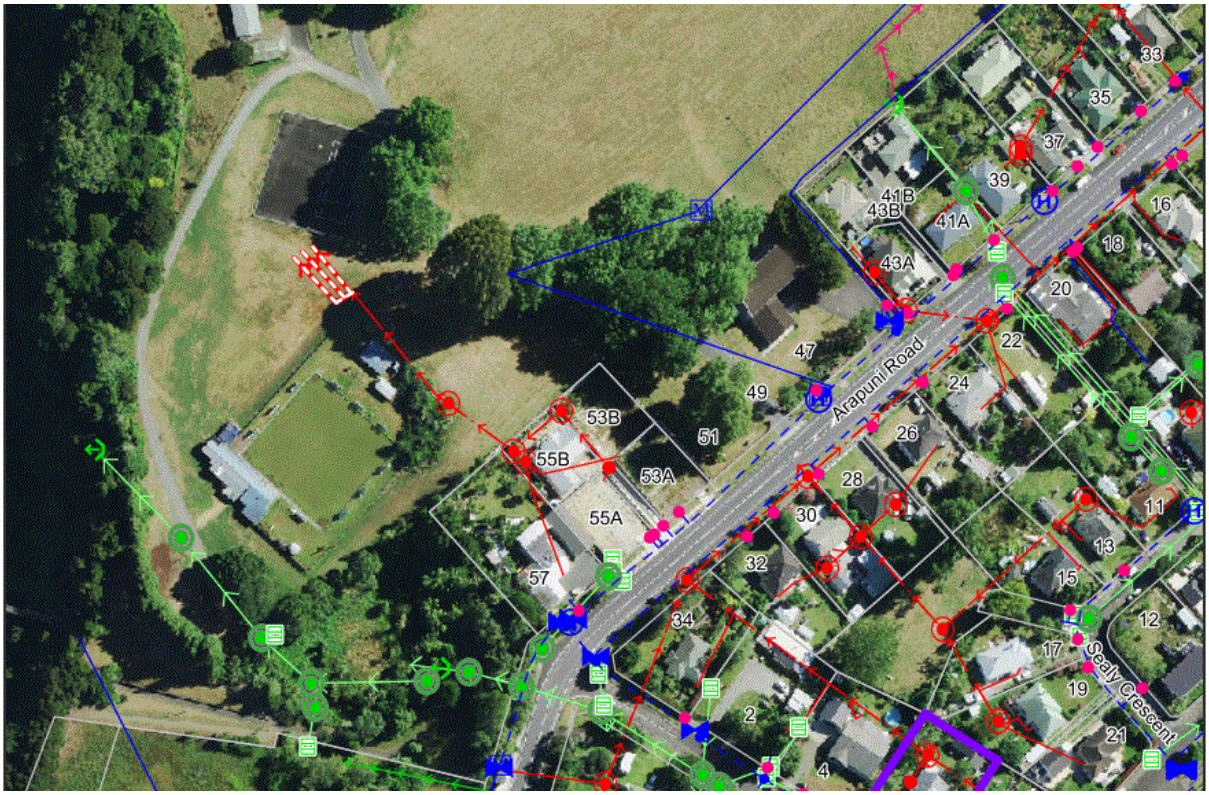


Figure 6.10 Proposed Arapuni pump station installation

completed within 2 years.

Tirau WWTP

Recent studies showed that the inlet works to the treatment plant are under capacity, future flows have been modelled as 45L/s from the Depot St WWPS, current capacities are 26L/s for the inlet screen and 17L/s for the grit removal system, in addition a finer 1mm screen was recommended to be installed in front of the MBR in addition to replacing the primary screen. Recommendations are below:

- Installation of a higher capacity inlet screen and grit removal system to align with the pump station upgrade,
- Units to be configured in a duty/standby arrangement for redundancy,
- Installation of a second fine screen in series to give additional protection to the membranes in the MBR (1mm aperture if the first screen is 3mm and 2mm if the first screen is 5mm).

The MBR plant itself is also nearing capacity. Screened effluent is treated in two parallel aerobic membrane bioreactors. Each bioreactor consists of two SINAP 150 membrane modules, with a total membrane surface area of 600m^2 (both reactors).

The plant reports an average flux of 0.6m^3/m^2/d. Based on this, the hydraulic throughput capacity of the plant is 360m^3/d.

When the flow exceeds this value, the following options are available to the operations staff.

- Divert the excess flows to the balance tank and return when the high flows subside.
- If high flows persist, the balance tank overflows to the old (now decommissioned) sludge drying beds.

  Plant bypass when peak flows exceed the above storage capacity.

6.10.2 Additional Proposed Capital Growth Projects

The following future growth projects were identified post the current LTP, based on the Watershed recommendations. They are not funded under the current LTP period, but it is expected that funding will be sought for construction after 2024. The project summary is as follows:

Tokoroa wastewater projects	$1,375,000
Baird Street PS Upgrade	$380,000
Harris Street PS Upgrade	$415,000
Chartwell Street PS Upgrade	$50,000
Gravity Pipe Upgrades	$530,000
Tirau wastewater projects	$1,485,000
Depot Street PS Upgrade	$740,000
Bear Street PS Upgrade	$50,000
Gravity Pipe Upgrades	$695,000
TOTAL:	$2,860,000

The project scope was identified based on the Watershed recommendations on significant further investigations to be undertaken. The cost estimates are based on very limited scope from Watershed or an understanding of the existing infrastructure and what condition this is in. The estimates are hence high level.

Additionally, ref. Section 5.2.7 New Growth Projects 2022.

6.10.3 New Capital Renewal Projects 2022

Arapuni Wastewater Treatment Plant Sand Filter Replacement was identified as a high priority capital renewal project to ensure Compliance with wastewater Resource Consents. The project is to Design & Build contract let by 31 October 2022. Construction completed by 30 June 2023.

The Wastewater component of Districtwide Water and Wastewater Telemetry and SCADA Upgrades was identified as a capital renewal project to ensure compliance with wastewater Resource Consents and drinking water standards.

The above projects are proposed to be carried out in financial years 2022/23 and 2023/24 (ref. Section 8.2, 8.3, Appendices F2, G3).

7 Quantifying and Managing Risk

Risk in its various forms is managed for all of Council's activities, not just the asset infrastructure. This chapter of the AMP identifies how risk is managed corporately and then how asset risk is managed.

Risks are events that may compromise the delivery of council's strategic objectives.

The risk management context:

- Risk management is a core business driver that influences all decision making and is not an isolated process.
- The corporate risk framework is applied across the organisation and identifies the criteria for risk evaluation and the responsibilities for managing risk.

7.1 Risk Management Strategy

This section outlines the processes set up by SWDC for assessing and managing risk.

Risk management is used as a strategic decision-making tool to assist with developing and prioritising strategies and work programmes.

SWDC currently manages its risks as Business Risk, Asset Risk, Emergency Management and Public Health Risks separately, based on the following risk documents:

- Corporate Risk Management Policy (Doc Set 200515. Adopted 2005. Revised March 2006)
- Asset Criticality and Risk Process Report (Waugh, May 2009)
- SWDC Water Supplies Public Health Risk Management Plan (April 2010). These have been renamed as Water Safety Plans.
- Waikato Civil Defence Emergency Management Group Plan 2016-2021.

The following flow chart indicates the Risk Management Process in terms of business risk and asset risks.

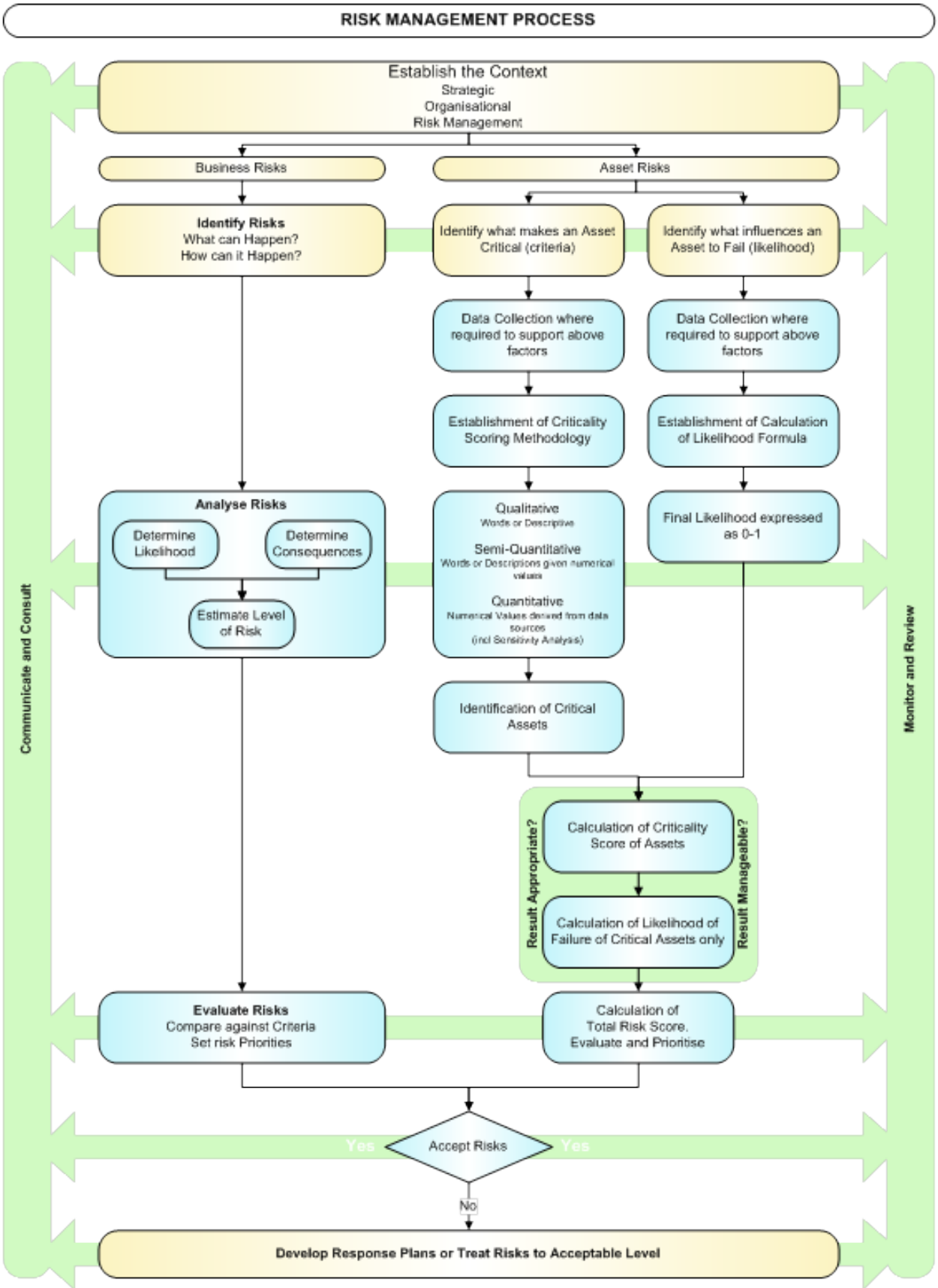


Figure 7.1 Risk Management Process

The Water Supplies Public Health Risk Management Plan (PHRMP) identified the risks to public health, ranked the relative importance of those risks and stated how those risks should be managed.

The Waikato Civil Defence and Emergency Management (CDEM) Group Plan provides a regionally based approach to risk management, using the 4 R's (Reduction, Readiness, Response and Recovery) and contains references to the Waikato Engineering Lifelines Group (since renamed as the Waikato Lifelines Utilities Group), which includes all major utility service providers.

For the purposes of the Wastewater AMP, risks are grouped and classified, and the principal risks are further described, in the following classes.

Table 7.1 Identifying Classes of Risks

Risk	Discussion	Management of Risk
Public Health Risks	Ensuring public health and providing clean drinking water is highly important to Council. Public Health Risk Management Plans (PHRMP's) have been developed for each of the six community Water Supplies. Public Health Risks associated with the Wastewater network are managed via the resource consent and compliance monitoring process. Council holds relevant consents for all wastewater discharges and monitors the quality of these discharges as required by the consent.	Public Health Risk Management Plan Resource Consent and Monitoring
Physical Risks	Physical risks to the infrastructure are generally: Risks from natural processes whether gradual or acting over a short period Risks created by the actions of other parties working in the vicinity of the assets Council has adopted construction and maintenance standards which are formulated to encourage appropriate planning prior to working on infrastructure; selection of durable materials; good workmanship, and appropriate processes. These will not always be sufficient to prevent physical damage by external forces or natural events. For example, failure to check before excavating near a water main can result in damage and loss of supply. Earthquakes and erosion due to flood or breaks in large diameter pipes create potentially high losses. Smaller faults may still create problems such as loss of supply to critical consumers (home dialysis patients, emergency services, major industry, etc).	Critical Assets
Business/Commercial Risks	Business or Commercial risks are those which result in decreased cash flow and/or inability to afford or implement (e.g., not enough resources) the works that are required. They include loss of large consumers (requiring the fixed cost burden to be absorbed by the remaining customers), poor timing of work causing less than optimal life-cycle cost, and failure to take advantage of any available subsidies. Council is considering of the impacts of COVID on the risks associated with wastewater services, as business and household usages change, and financial impacts affect users' ability to pay for services.	Corporate Risk Plan

Risk	Discussion	Management of Risk
Health & Safety Risks	These are risks posed to people and property, consequential to the physical actions or omissions of Council staff or contractors, or failure of equipment. Council has sufficiently comprehensive health & safety policies in place including the requirement for Business Units and external contractors to have such policies to minimise health & safety risks associated with operating heavy machinery and handling hazardous materials.	Corporate Risk Plan Contractor Health and Safety Quality Plan South Waikato Health and Safety Quality Plan
Environmental Risks	Risks of environmental damage arising from the operation of assets and/or physical actions or omissions of Council staff or contractors are generally managed in accordance with resource consent conditions, where applicable.	Consenting and Performance Monitoring/ Reporting
Regulatory Risks	Risks of prosecution due to failure to comply with laws and resource consent conditions. The Health (Drinking Water) Amendment Act 2007 represents a regulatory risk that Council manages. A decrease in the grading of supplies, and continuing or increased water quality problems, may also result in loss of public confidence in the management. The power of Waikato Regional Council to review and amend resource consent conditions during the duration of the consents represents a regulatory risk exposure to Council. The consequence of this risk might be inability to supply water to consumers, which is in itself of sufficient magnitude that dialogue would occur with WRC prior to actually amending conditions and well before ceasing supply.	Consenting and Performance Monitoring/ Reporting Waikato Regional Council Ministry of Health

7.2 Corporate Risk Management

Risk management at the council wide level is focused on business continuity planning.

The Business Continuity Plan (aka Site Management Plan) is coordinated by the Emergency Management Manager/Principal Rural Fire Officer and has the objective of ensuring that essential business operations are restored promptly and efficiently following any physical disaster at Council's premises. *(The BCP is currently stored in S/Environment/Emergency Mgt/dm-exceptions/Business Continuity/BCP Plans).*

The asset infrastructure related business functions include the followings that are identified as Critical (requiring full recovery within 48 hours or partial recovery within 24 hours):

- Sewage – treatment, reticulation repairs, pump station operation and storm flood response

7.3 Insurance

South Waikato District Council has engaged Aon New Zealand insurance brokers to handle all its insurance needs, and forms part of our commitment to the Local Authority Shared Services (LASS) scheme.

Public Liability Insurance

Council currently holds public liability insurance to the value of $50 M for each and every claim with certain limitations. A copy of this is located in Council's corporate support section.

Material Damage – Infrastructure Insurance

While insurance was previously held with the Local Authority Protection Programme Disaster Fund (LAPP), SWDC moved away from LAPP after the Christchurch earthquakes made a significant impact to existing LAPP funds.

Infrastructure insurance is now handled by Aon New Zealand through London based insurers. This covers all assets as previously provided by LAPP and includes:

- Water reticulation, treatment, and storage
- Wastewater reticulation and treatment
- Stormwater drainage
- Dams and canals
- Flood protection schemes including stop banks (not applicable to SWDC)
- Flood gates, seawalls, and harbour risks such as buoys, beacons and uninsurable foreshore lighthouses (not applicable to SWDC)

Professional Indemnity Insurance

Professional indemnity insurance covers SWDC for professional liability protection to the value of $50 M and covers claims from actual or alleged acts, errors or omissions or conduct omitted or committed in connection with the business.

7.4 Civil Defence, Lifelines Utilities and Emergency Response Plans

Civil Defence Emergency Management

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to coordinate Plans, Programmes and Activities related to CDEM across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups.

Council recognises its obligations under the CDEM Act and participates in a Waikato Region-wide Civil Defence Emergency Management Group (EMG). The Waikato CDEMG is responsible for all matters involving staff training, general Civil Defence public awareness and maintaining contact lists for schools, pre-schools, rest-homes, and the like. Each Local Authority maintains its own contacts for local resources.

The District is generally sheltered from most natural disasters, although there are risks associated with high wind, flooding, and wind-blown ash from volcanic eruption from Mount Ruapehu.

The following documents are available for guidance in Civil Defence and Emergency Management

(The Emergency Management Manager will update these to align with the Waikato CDEM processes)

- SWDC Emergency Response Plan Emergency Operating Procedures 2016/2017
- Civil Defence Emergency Management Plan Southern Emergency Operations Area of South Waikato and Taupō Districts.
- Waikato Civil Defence Emergency Management Group Plan 2011-2015.
- The National Civil Defence Emergency Management Plan

Waikato Lifelines Utilities Group (WLUG)

Lifelines are the essential ‘utility’ services that support the life of a community. These services include Water, Wastewater, Power, Gas, Telecommunications and Transportation networks.

SWDC is a member of the WLUG, which is comprised of representatives from the Waikato region’s territorial authorities and major energy, telecommunications, and transportation sector organisations. The WLUG provides support to the Emergency Operations Centres that may be required during a major service failure or civil defence emergency.

Current projects include:

- The Group Vulnerability Project – Assessing the Waikato’s utilities infrastructure vulnerability to natural and man-made hazards and developing measures to reduce the effects.
- The Group Priority and Alternative Route Plan – Identifying the routes that may be used during an event, in order to ensure that access is available for emergency services, access to critical utilities and evacuation purposes.
- The Critical Fuel Supply Plan – Planning for fuel to be available to both the Lifelines utilities and the public during an emergency event.

- The Coordination Protocols – To assist Lifelines utilities to coordinate, communicate and share information during the Response and Recovery phases of an emergency. An associated Contact Details List is maintained for reference.
- The Group Lifeline Utilities Coordinator and Supporting Staff – Role Descriptions – Ensuring that coordinators are appointed and trained to manage activities during an emergency.

SWDC continues to co-operate within the framework of the WLUG to implement the guidelines outlined in Working Together Lifeline Utilities and Emergency Management.

Based on the District's geographical location, the most significant hazard SWDC faces is the spread of volcanic ash from an eruption. Emergency Management plans are in place for this scenario.

SWDC is committed to monitoring and reviewing its policies around climate change to ensure alignment with national legislation.

Continual development of contingency planning requires revising and improving these plans through emergency response exercises or scenarios.

7.5 Network Specific Risk Management

7.5.1 Asset Criticality (consequence of failure)

The probability of failure is important for allowing calculation of an overall risk score. Asset Risks are traditionally managed in a less formal, practical way, e.g., two pumps installed at a pump station in-case one fails. The 'Asset Criticality and Risk Process Report', Waugh Infrastructure Management, September 2007, aimed to assess Asset Risks in a formal approach by prioritising the risks into a matrix.

A list of critical assets has been identified for further analysis as shown below.

Table 7.2: Criticality Matrix

Weighting	Criticality Scoring				
Criteria	Total Score = Weighting x Level	Highest Individual Weighted Point Score	Criticality Assessed from Total Score	Criticality Assessed from Highest Point	Overall Criticality
Proximity to Water Intake	345	80	High	Medium	High
Trunk Mains and Facilities	345	80	High	Medium	High
Proximity WILL result in overflow to water way	265	80	High	Medium	High
Aerial Sewers (identified in workshop 30 July 07)	250	60	High	Medium	High
WW Adjacent to Sensitive Infrastructure	240	80	High	Medium	High
Facilities – Pump stations	230	60	High	Medium	High
WW for Main shopping streets, CBD	225	60	Medium	Medium	Medium
Ground Conditions require extra stabilisation	225	60	Medium	Medium	Medium
Asset in a flood plain	220	60	Medium	Medium	Medium
Under State Highway (SH1)	215	60	Medium	Medium	Medium
Rising Mains	210	60	Medium	Medium	Medium
Under State Highway (other)	210	60	Medium	Medium	Medium
Proximity MAY result in overflow to water way	210	60	Medium	Medium	Medium
Asset in Retention Dam area	200	60	Medium	Medium	Medium
Serving public facilities	195	80	Medium	Medium	Medium
Siphons – large main (none identified in AMS)	190	60	Medium	Medium	Medium
Sewers located under buildings	165	40	Medium	Low	Medium

Weighting	Criticality Scoring				
Criteria	Total Score = Weighting x Level	Highest Individual Weighted Point Score	Criticality Assessed from Total Score	Criticality Assessed from Highest Point	Overall Criticality
Asset Under Rail	155	60	Medium	Medium	Medium
Deep Assets (no information available in 2007)	140	40	Low	Low	Low
Located close to Burial Grounds	120	40	Low	Low	Low
Public Health Service (Hospital, Maternity, A&E Clinic)	115	40	Low	Low	Low
Rest Homes	115	30	Low	Low	Low

The above Criticality Scoring was undertaken in 2008 and is now considered to be unreliable. We intend to review and update Criticality during the current AMP period, which is listed in the Improvement tasks.

7.5.2 Asset Probability of Failure

The next stage of the application network specific risk management programme is the assessment of the probability of failure. This is important for allowing calculation of an overall risk score.

Rather than a complete theoretical desk top exercise, Council has implemented a critical asset inspection programme that measures asset condition and performance and assesses probability of failure.

This programme is in progress and the results of the assessment of failure probability and completed asset risk assessment will be included in the next update of this plan. Location Maps of Critical Assets are contained as Appendix H.

7.5.3 New Risks Since the Last AMP

New risks since the last AMP to the Wastewater services activities of Council include the following:

- The impacts of the Government-led water reform, including the final outcomes of the Water Services Bill and establishment of Taumata Arowai. These may impact the financial, operational and asset ownership of wastewater services in the District.
- The impacts of COVID on the risks associated with wastewater services, as business and household usages change, and financial impacts affect users' ability to pay for services.

7.6 Business Continuity Plan and Emergency Management Plan

As distinct from naturally occurring events impacting directly on the network, Council recognises that naturally occurring and other classes of events (such as a fire at the Watermark Operations Room) may disrupt wider process aspects of service delivery. Council is currently undertaking an update of its BCP and EMP to address continuity issues.

7.7 Significant Negative Effects

The operation of community wastewater network and associated assets generate effects on the community, other infrastructure, and the environment. These effects are managed within legislative and consulting frameworks.

The Negative Effects associated with the Wastewater Activity are listed in the table below, along with Council's approach and/or future actions to mitigate or avoid the effects where practical.

These Negative Effects must be balanced against the positive contribution the activity makes to achieving Council's Vision, Outcomes and Strategies.

Table 7.3 Negative Effects – Wastewater Activity

Effect	Status of Effect		Impact on Outcomes (existing situation)		Existing Approach or Proposed Action to Address
	Existing	Potential	Well managed Infrastructure	Sustainable operations	
Wastewater Treatment Plants					
Discharge of treated wastewater to rivers	ó	ñ	Mod	Mod	Maintain current consents for all WWTP discharges Upgrade treatment plants to ensure ongoing compliance with resource consents
Discharge of odour	ó	ò	Minor	Minor	Work to improve odour control
Pump Stations					
Discharge of odour	ó	ò	Minor	Minor	Reported and resolved within short period
Overflows	ó	ó	Mod	Minor	Pump station overflows are generally reported and resolved within a short space of time Renewals strategy will incorporate investigation of flows and storage requirements
Noise	ó	ó	Minor	Minor	High degree of noise mitigation in residential areas
Rising Mains and Reticulation					
Discharge of odour	ó	ò	Minor	Minor	Reported and resolved within short period
Overflows	ó	ó	Mod	Minor	High level of inspections carried out Renewals strategy will incorporate investigation of flows and storage requirements

7.8 District Map

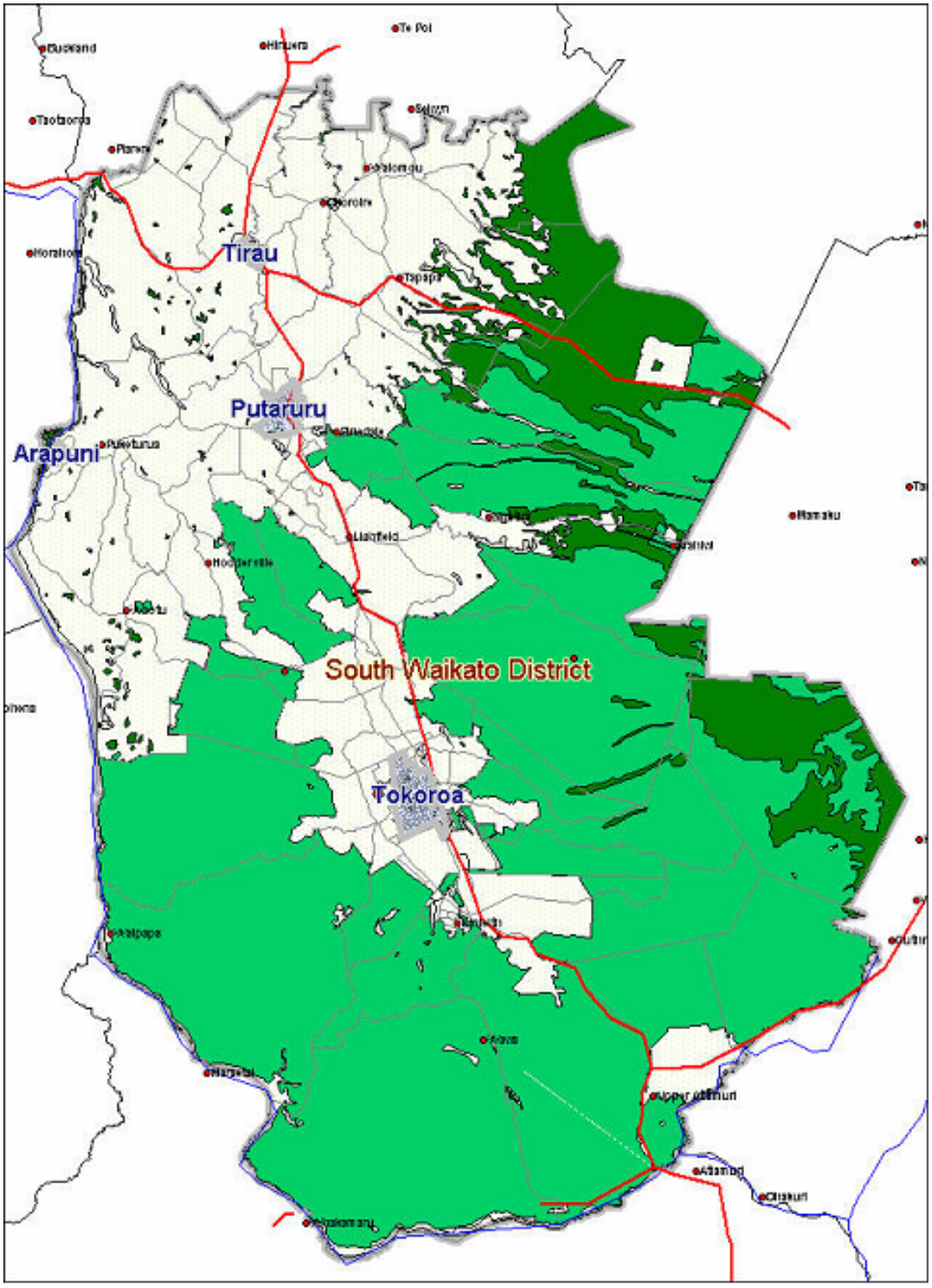


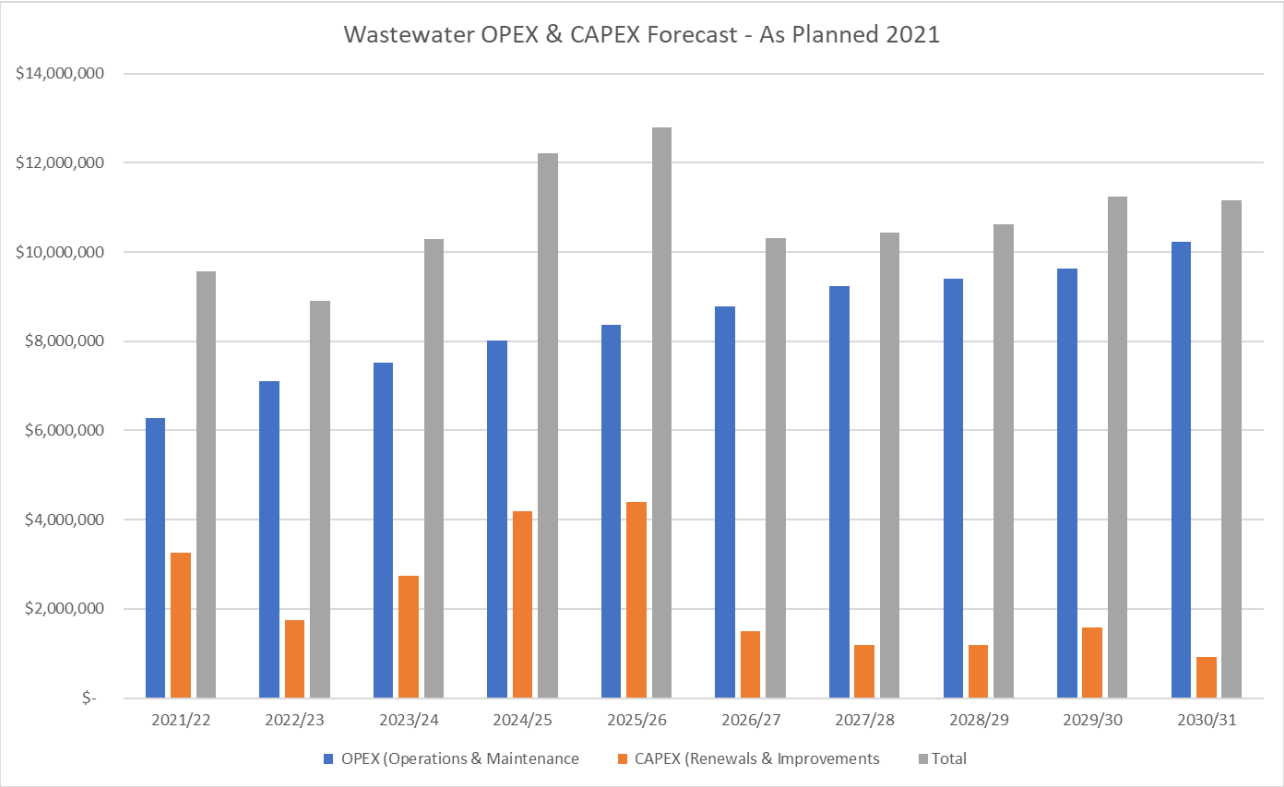
Figure 7.2 District Map of South Waikato

8 Financial Forecasts

8.1 Summary of Expenditure Forecast

The overall OPEX and CAPEX budget projections are shown below. The table below summarises financial projections for the planning period, as of 2021. These are expressed in 2020/21 dollars and have not been indexed for inflation.

The increase of the OPEX costs is linked to the Tokoroa WWTP upgrade and the associated increased supply of methanol to enable plant operation. Additional OPEX increased growth is associated with the Putāruru network upgrades.

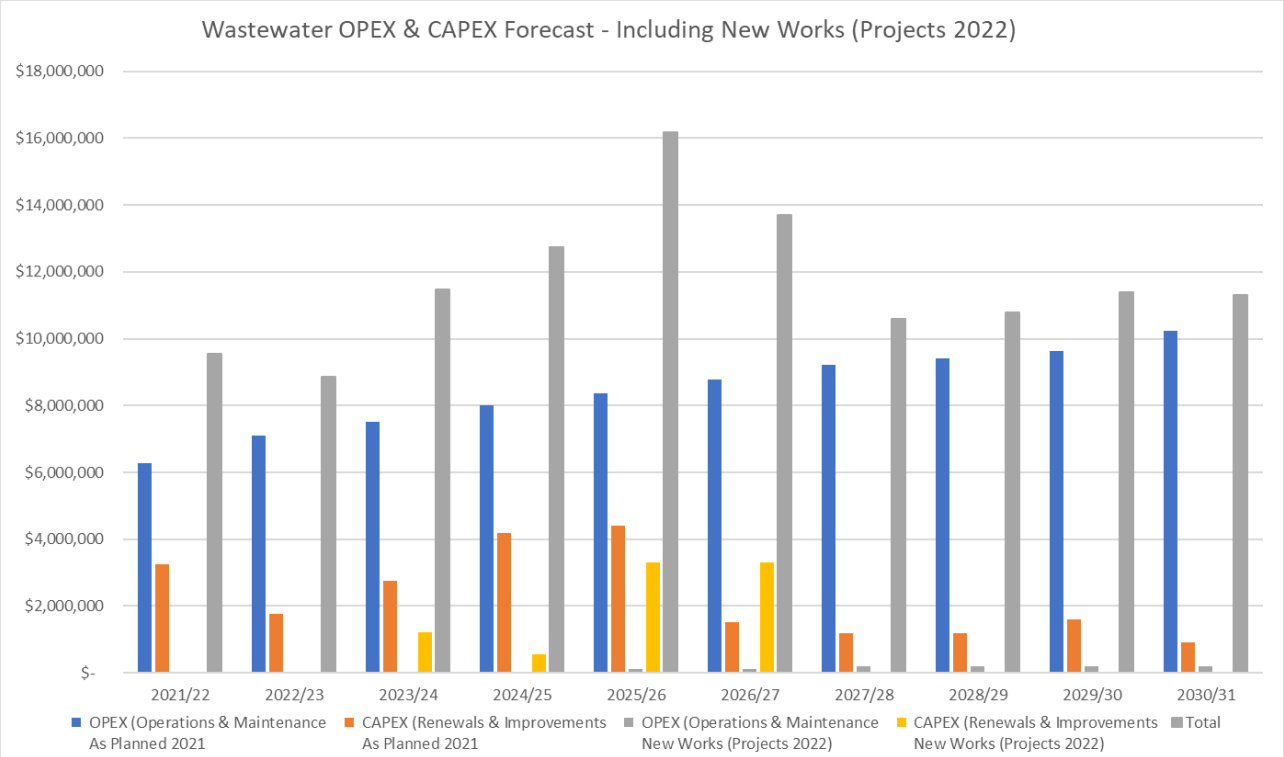


OPEX & CAPEX EXPENDITURE	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX (Renewals & Improvements	$ 3,253,000	$ 1,754,500	$ 2,742,000	$ 4,178,500	$ 4,400,000	$ 1,506,000	$ 1,186,000	$ 1,191,000	$ 1,592,372	$ 911,000	$ 22,714,372
OPEX (Operations & Maintenance	$ 6,281,422	$ 7,111,905	$ 7,522,061	$ 8,005,880	$ 8,367,405	$ 8,778,893	$ 9,223,680	$ 9,402,378	$ 9,621,643	$ 10,223,058	$ 84,538,325
Total	**$ 9,564,422**	**$ 8,896,405**	**$ 10,294,061**	**$ 12,214,380**	**$ 12,797,405**	**$ 10,314,893**	**$ 10,439,680**	**$ 10,623,378**	**$ 11,244,015**	**$ 11,164,058**	**$ 107,552,697**

Figure 8.1 Summary of Expenditure Forecast

In 2022, the capital New Projects were proposed to be added to the scope of the originally planned Financial Forecast in the following Figure 8.3, as detailed in Appendix G and in this section below, will include Capital wastewater works with the expenditure planned for financial years 2025/26 and 2026/27.

The proposed new structures and networks will incur annual Consequential Operational Expenditure in the year followed the completion of the corresponding capital works and onwards. The contribution of the New Projects-2022 Consequential OPEX is insignificant compared to the existing Operational and Maintenance expenditure.

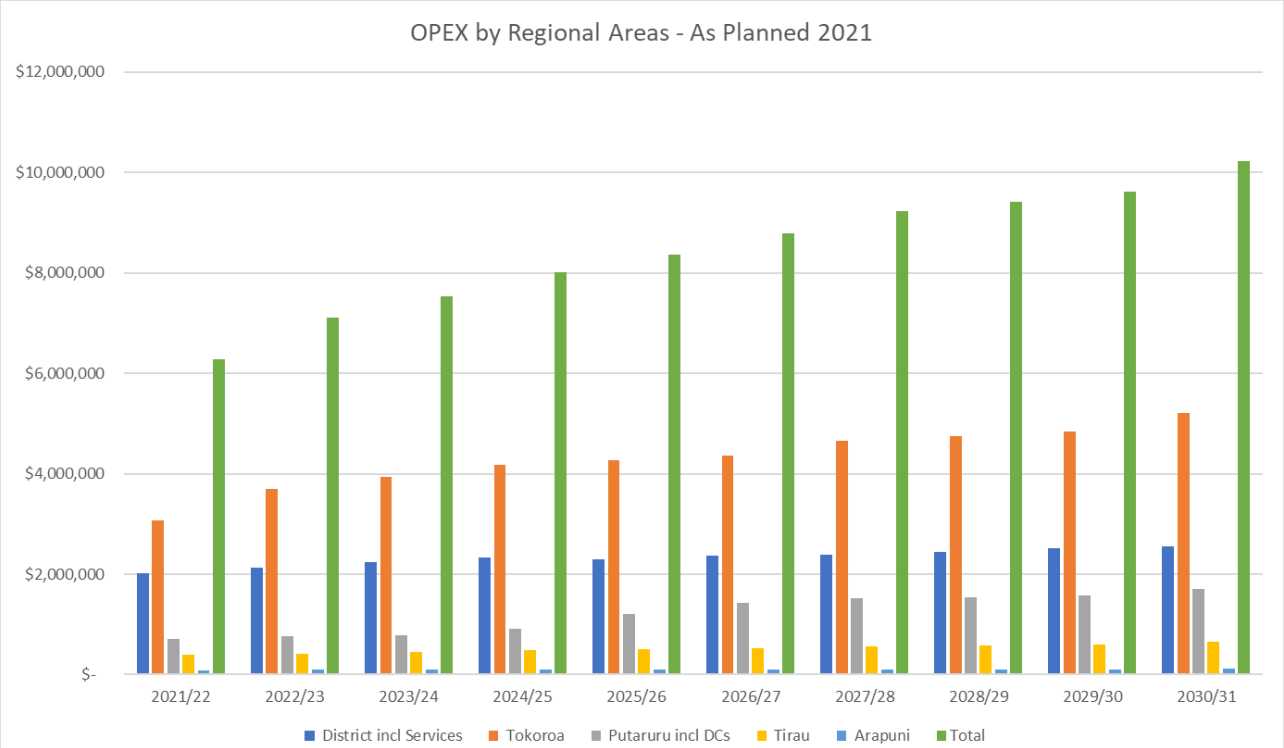


OPEX & CAPEX EXPENDITURE	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
CAPEX (Renewals & Improvements As Planned 2021	$ 3,253,000	$ 1,754,500	$ 2,742,000	$ 4,178,500	$ 4,400,000	$ 1,506,000	$ 1,186,000	$ 1,191,000	$ 1,592,372	$ 911,000	$ 22,714,372
OPEX (Operations & Maintenance As Planned 2021	$ 6,281,422	$ 7,111,905	$ 7,522,061	$ 8,005,880	$ 8,367,405	$ 8,778,893	$ 9,223,680	$ 9,402,378	$ 9,621,643	$ 10,223,058	$ 84,538,325
CAPEX (Renewals & Improvements New Works (Projects 2022)	$ -	$ -	$ 1,203,125	$ 553,125	$ 3,290,291	$ 3,290,291	$ -	$ -	$ -	$ -	$ 8,336,832
OPEX (Operations & Maintenance New Works (Projects 2022)		$ -	$ -	$ 6,500	$ 117,125	$ 117,125	$ 182,931	$ 182,931	$ 182,931	$ 182,931	$ 972,473
Total	**$ 9,534,422**	**$ 8,866,405**	**$ 11,467,186**	**$ 12,744,005**	**$ 16,174,821**	**$ 13,692,309**	**$ 10,592,611**	**$ 10,776,309**	**$ 11,396,946**	**$ 11,316,989**	**$ 116,562,002**

Figure 8.2 Wastewater OPEX & CAPEX Forecast plus New Projects 2022

8.2 OPEX (Operations and Maintenance) LTP Expenditure Forecast

The overall OPEX budget projections are shown below. The table below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation.



OPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
District incl Services	$ 2,013,399	$ 2,130,882	$ 2,245,166	$ 2,327,922	$ 2,299,328	$ 2,369,401	$ 2,390,829	$ 2,441,350	$ 2,511,969	$ 2,544,725	$ 84,538,326
Tokoroa	$ 3,075,937	$ 3,697,967	$ 3,944,583	$ 4,179,790	$ 4,260,431	$ 4,358,958	$ 4,646,308	$ 4,741,049	$ 4,836,644	$ 5,206,894	$ 245,000
Putaruru incl DCs	$ 702,144	$ 769,592	$ 786,982	$ 908,253	$ 1,201,602	$ 1,426,590	$ 1,514,335	$ 1,532,453	$ 1,569,762	$ 1,702,562	$ 663,750
Tirau	$ 399,292	$ 420,788	$ 450,869	$ 492,527	$ 506,794	$ 522,365	$ 565,764	$ 579,141	$ 592,944	$ 652,201	$ 158,928
Arapuni	$ 90,651	$ 92,675	$ 94,460	$ 97,388	$ 99,250	$ 101,579	$ 106,445	$ 108,385	$ 110,325	$ 116,676	$ 314,295
Total	**$ 6,281,423**	**$ 7,111,904**	**$ 7,522,060**	**$ 8,005,880**	**$ 8,367,405**	**$ 8,778,893**	**$ 9,223,681**	**$ 9,402,378**	**$ 9,621,644**	**$ 10,223,058**	**$ 84,538,326**

Figure 8.3 OPEX by Regional Area

Further breakdown of the OPEX by project description, cost type and area are in Appendix G.

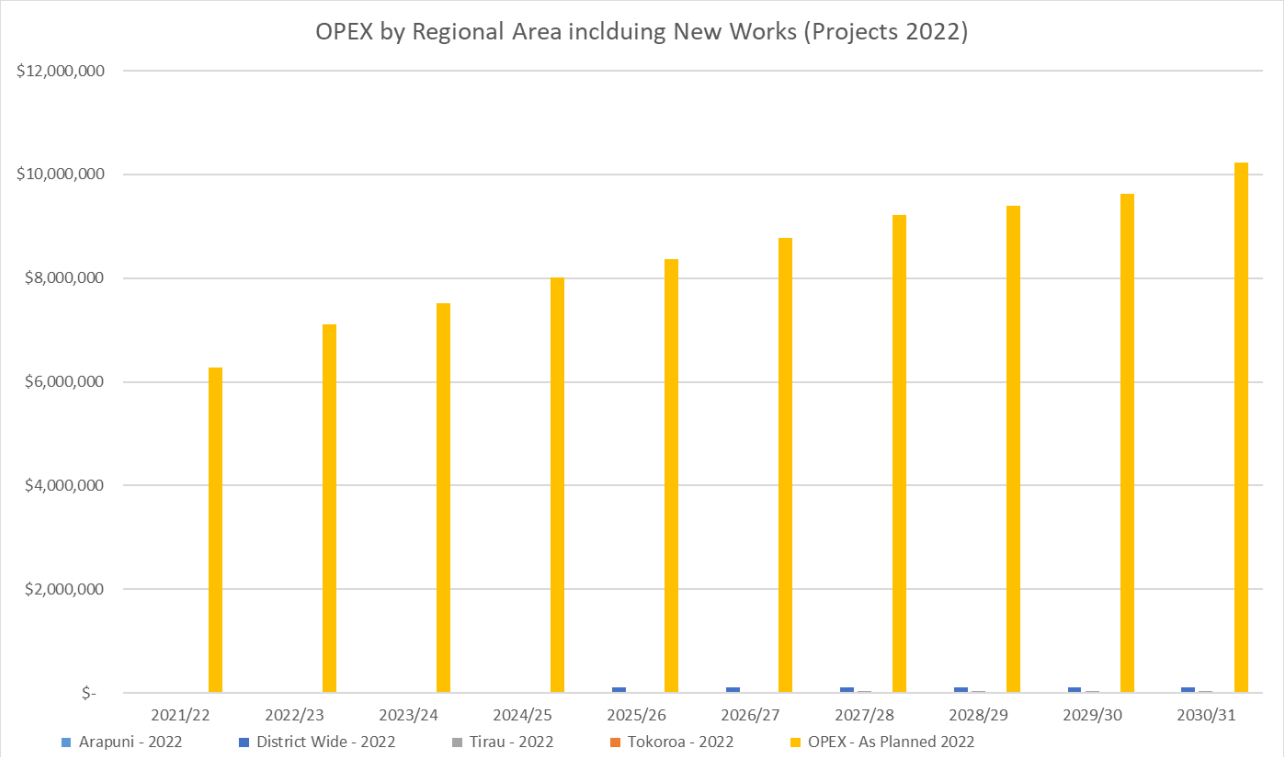
8.3 Consequential OPEX for New Works (Projects 2022)

The operation and maintenance requirements consequential to wastewater network New Works (Projects 2022) are summarised as follows.

Table 8.1 OPEX expenditure for wastewater network growth projects

Community	OPEX Type	Investment Category	Project	OPEX Factor, Annually
Tokoroa	Improvements	Growth	Tirau Wastewater Project	1%
			Tokoroa Wastewater Growth Projects	1%
		LOS	Arapuni Road WWPS	1%
			Tokoroa Ferguson Street Wastewater Main Renewal	1%
SWDC	Renewals	Renewals	Districtwide Water and Wastewater Telemetry and SCADA Upgrades	10%

The addition of the New Works (Projects 2022) Consequential OPEX and the updated overall District OPEX are shown below (Figure 8.3). Approximately 48% of the New Projects' Consequential OPEX is allocated to the Districtwide Water and Wastewater Telemetry and SCADA upgrades. Overall, the Consequential OPEX for New Works (Projects 2022) is significantly lower than the total OPEX planned by LTP 2021 (~1.6% of the "as planned 2021" 10-year total).



OPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
OPEX - As Planned 2022	$ 6,281,423	$ 7,111,904	$ 7,522,060	$ 8,005,880	$ 8,367,405	$ 8,778,893	$ 9,223,681	$ 9,402,378	$ 9,621,644	$ 10,223,058	$ 84,538,326
Arapuni - 2022				$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 245,000
District Wide - 2022					$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 663,750
Tirau - 2022							$ 39,732	$ 39,732	$ 39,732	$ 39,732	$ 158,928
Tokoroa - 2022				$ 3,000	$ 3,000	$ 3,000	$ 29,074	$ 29,074	$ 29,074	$ 29,074	$ 314,295
Total	**$ 6,281,423**	**$ 7,111,904**	**$ 7,522,060**	**$ 8,012,380**	**$ 8,484,530**	**$ 8,896,018**	**$ 9,406,612**	**$ 9,585,309**	**$ 9,804,575**	**$ 10,405,989**	**$ 85,510,799**

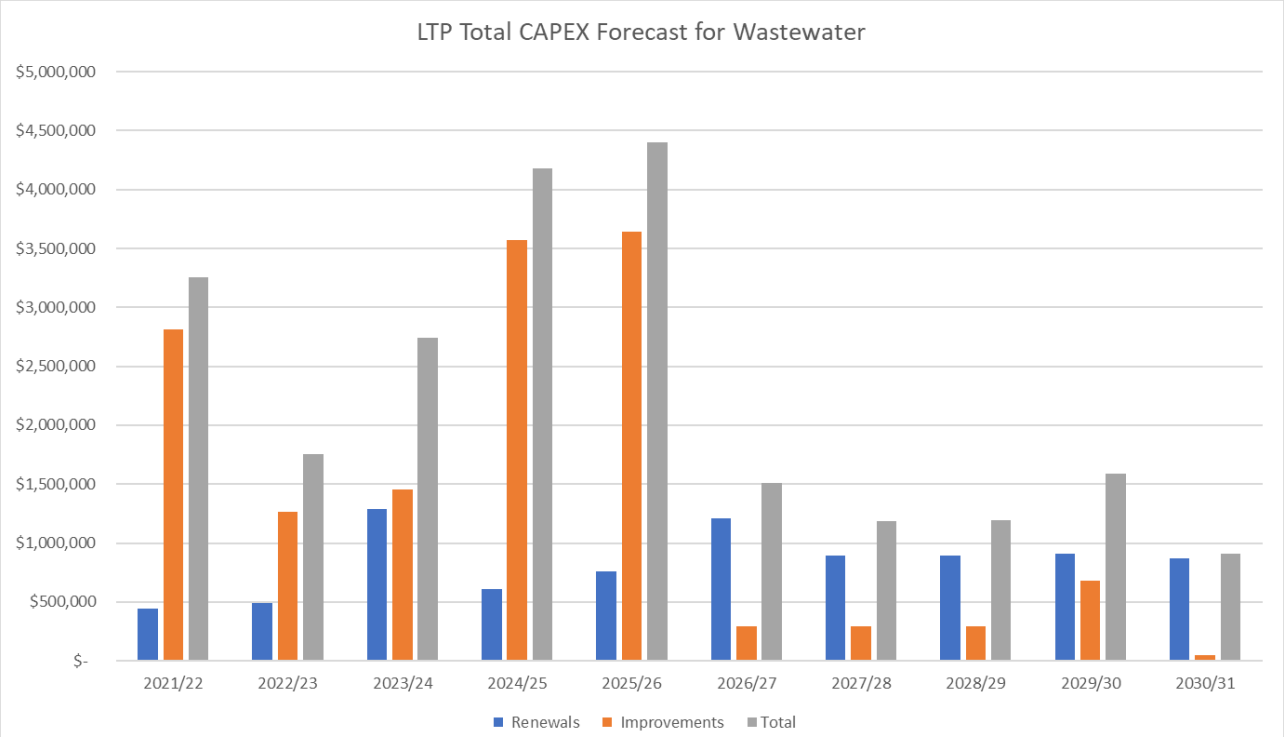
Figure 8.4 OPEX by Regional Area plus New Projects 2022

8.4 CAPEX (Renewals and Improvements) LTP Expenditure Forecast

The tables below summarises financial projections for the planning period. These are expressed in 2020/21 dollars and have not been indexed for inflation.

8.4.1 Total LTP Capital Expenditure Forecast 2021

The total 2021-planned LTP Capital Expenditure by Renewals and Improvements expenditure types are as follows.



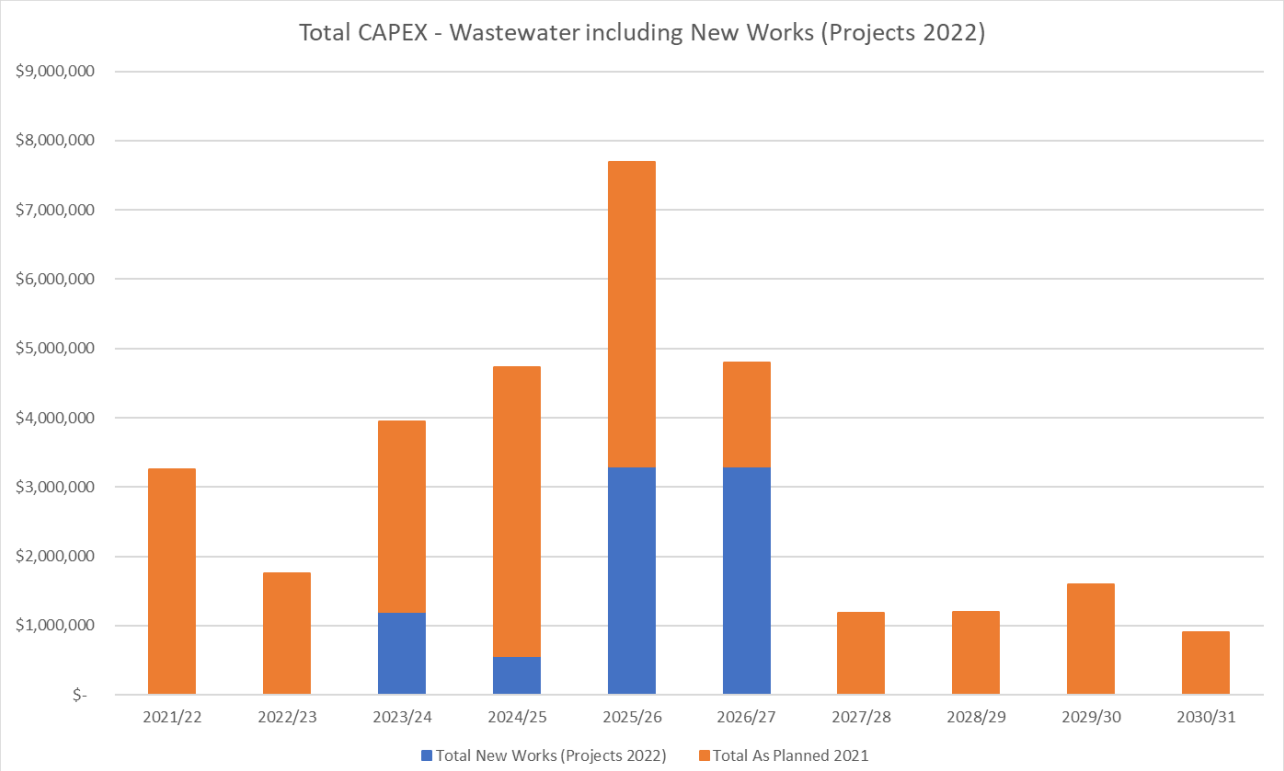
CAPEX (Renewals & Improvements	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Renewals	$ 440,000	$ 489,500	$ 1,287,000	$ 608,500	$ 756,000	$ 1,211,000	$ 891,000	$ 896,000	$ 911,000	$ 866,000	$ 8,356,000
Improvements	$ 2,813,000	$ 1,265,000	$ 1,455,000	$ 3,570,000	$ 3,644,000	$ 295,000	$ 295,000	$ 295,000	$ 681,372	$ 45,000	$ 14,358,372
Total	**$ 3,253,000**	**$ 1,754,500**	**$ 2,742,000**	**$ 4,178,500**	**$ 4,400,000**	**$ 1,506,000**	**$ 1,186,000**	**$ 1,191,000**	**$ 1,592,372**	**$ 911,000**	**$ 22,714,372**

Figure 8.5 Capital Expenditure by Expenditure Type

8.4.2 New Capital Projects addition 2022

With the contribution of the New Works (Projects 2022) that were additionally planned in 2022, the total CAPEX Forecast changes occur in financial years 2023/24 through 2026/27. The wastewater capital renewals and improvements are detailed in Sections 5.2.7 and 6.7.5. The New Works (Projects 2022) impact on the overall CAPEX budget is shown in Figure 8.6 below.

Detail on all Three Waters' New Works (Projects 2022) proposed as an addition to the originally planned by LTP-2021 scope can be found in Appendix G.

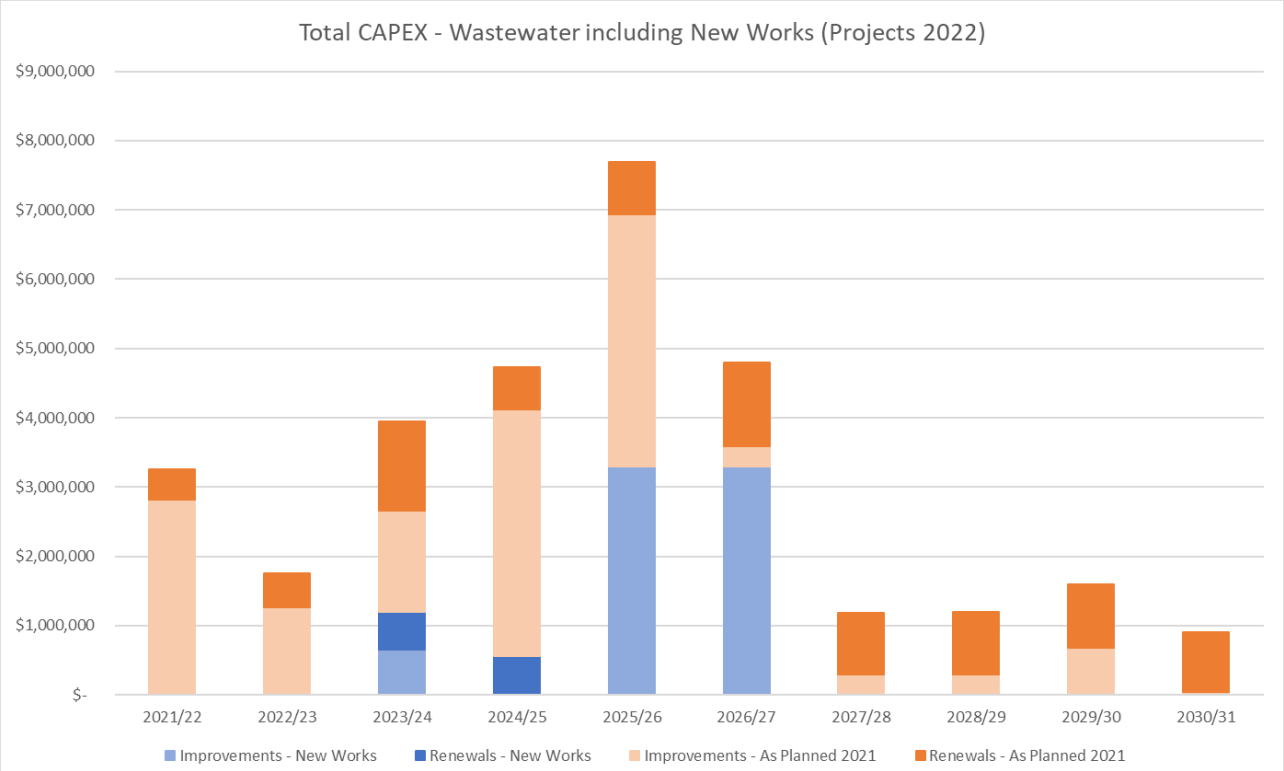


CAPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Renewals - New Works			$ 553,125	$ 553,125							$ 1,106,250
Improvements - New Works			$ 650,000		$ 3,290,291	$ 3,290,291					$ 7,230,582
Total New Works (Projects 2022)			**$ 1,203,125**	**$ 553,125**	**$ 3,290,291**	**$ 3,290,291**					**$ 8,336,832**
Renewals - As Planned 2021	$ 440,000	$ 489,500	$ 1,287,000	$ 608,500	$ 756,000	$ 1,211,000	$ 891,000	$ 896,000	$ 911,000	$ 866,000	$ 8,356,000
Improvements - As Planned 2021	$ 2,813,000	$ 1,265,000	$ 1,455,000	$ 3,570,000	$ 3,644,000	$ 295,000	$ 295,000	$ 295,000	$ 681,372	$ 45,000	$ 14,358,372
Total As Planned 2021	**$ 3,253,000**	**$ 1,754,500**	**$ 2,742,000**	**$ 4,178,500**	**$ 4,400,000**	**$ 1,506,000**	**$ 1,186,000**	**$ 1,191,000**	**$ 1,592,372**	**$ 911,000**	**$ 22,714,372**
Total Capex	**$ 3,253,000**	**$ 1,754,500**	**$ 3,945,125**	**$ 4,731,625**	**$ 7,690,291**	**$ 4,796,291**	**$ 1,186,000**	**$ 1,191,000**	**$ 1,592,372**	**$ 911,000**	**$ 31,051,204**

Figure 8.6 New Projects addition to Capital Expenditure Forecast 2021

Capital New Works (Projects 2022) increase the capital expenditure of LTP-2021 by approximately 27%. In particular, Tokoroa Wastewater Growth, Tirau Wastewater Project, Arapuni Road WWPS, Tokoroa Ferguson Street Wastewater Main Renewal, and Districtwide Water and Wastewater Telemetry and SCADA upgrades (wastewater component) jointly represent:

- For Financial Year 2023/24 - 30% of the total updated CAPEX, (as planned 2021 plus New Works (Projects 2022))
- For Financial Year 2024/25 - 12% of the total updated CAPEX, (as planned 2021 plus New Works (Projects 2022)).
- For Financial Year 2025/26 - 43% of the total updated CAPEX, (as planned 2021 plus New Works (Projects 2022))
- For Financial Year 2026/27 - 69% of the total updated CAPEX, (as planned 2021 plus New Works (Projects 2022))

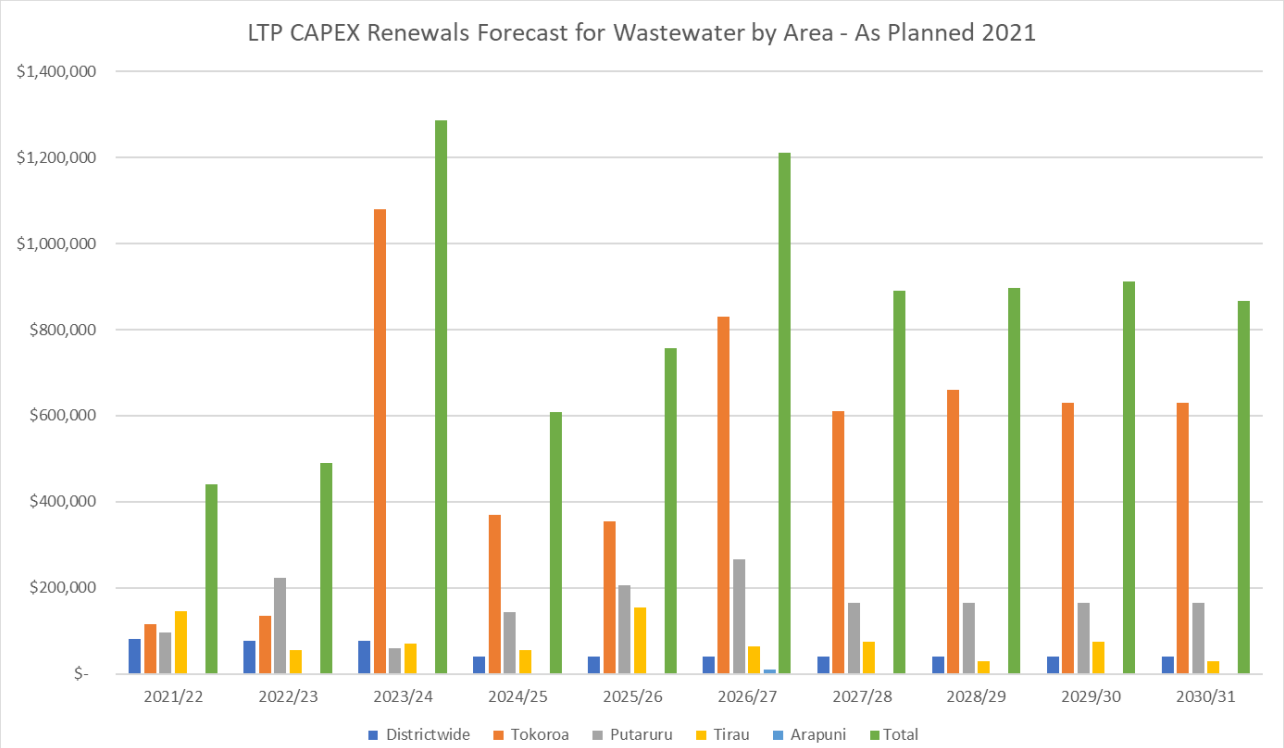


CAPEX	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtw ide Water and Wastew ater Telemetry and SCADA upgrades			$ 553,125	$ 553,125							$ 1,106,250
Renewals - New Works			$ 553,125	$ 553,125							$ 1,106,250
Tokoroa Wastew ater Grow th					$ 1,303,691	$ 1,303,691					$ 2,607,382
Tirau Wastew ater					$ 1,986,600	$ 1,986,600					$ 3,973,200
Arapuni Road WWPS			$ 350,000								$ 350,000
Tokoroa Ferguison St Wastew ater Main Renew al			$ 300,000								$ 300,000
Improvements - New Works			$ 650,000		$ 3,290,291	$ 3,290,291					$ 7,230,582
Total New Works (Projects 2022)			**$ 1,203,125**	**$ 553,125**	**$ 3,290,291**	**$ 3,290,291**					**$ 8,336,832**
Renewals - As Planned 2021	$ 440,000	$ 489,500	$ 1,287,000	$ 608,500	$ 756,000	$ 1,211,000	$ 891,000	$ 896,000	$ 911,000	$ 866,000	$ 8,356,000
Improvements - As Planned 2021	$ 2,813,000	$ 1,265,000	$ 1,455,000	$ 3,570,000	$ 3,644,000	$ 295,000	$ 295,000	$ 295,000	$ 681,372	$ 45,000	$ 14,358,372
Total As Planned 2021	**$ 3,253,000**	**$ 1,754,500**	**$ 2,742,000**	**$ 4,178,500**	**$ 4,400,000**	**$ 1,506,000**	**$ 1,186,000**	**$ 1,191,000**	**$ 1,592,372**	**$ 911,000**	**$ 22,714,372**
Total Capex	**$ 3,253,000**	**$ 1,754,500**	**$ 3,945,125**	**$ 4,731,625**	**$ 7,690,291**	**$ 4,796,291**	**$ 1,186,000**	**$ 1,191,000**	**$ 1,592,372**	**$ 911,000**	**$ 31,051,204**

Figure 8.7 Total Capital Expenditure Forecast for Wastewater plus New Projects 2022

8.4.3 Capital Renewals Expenditure Forecast

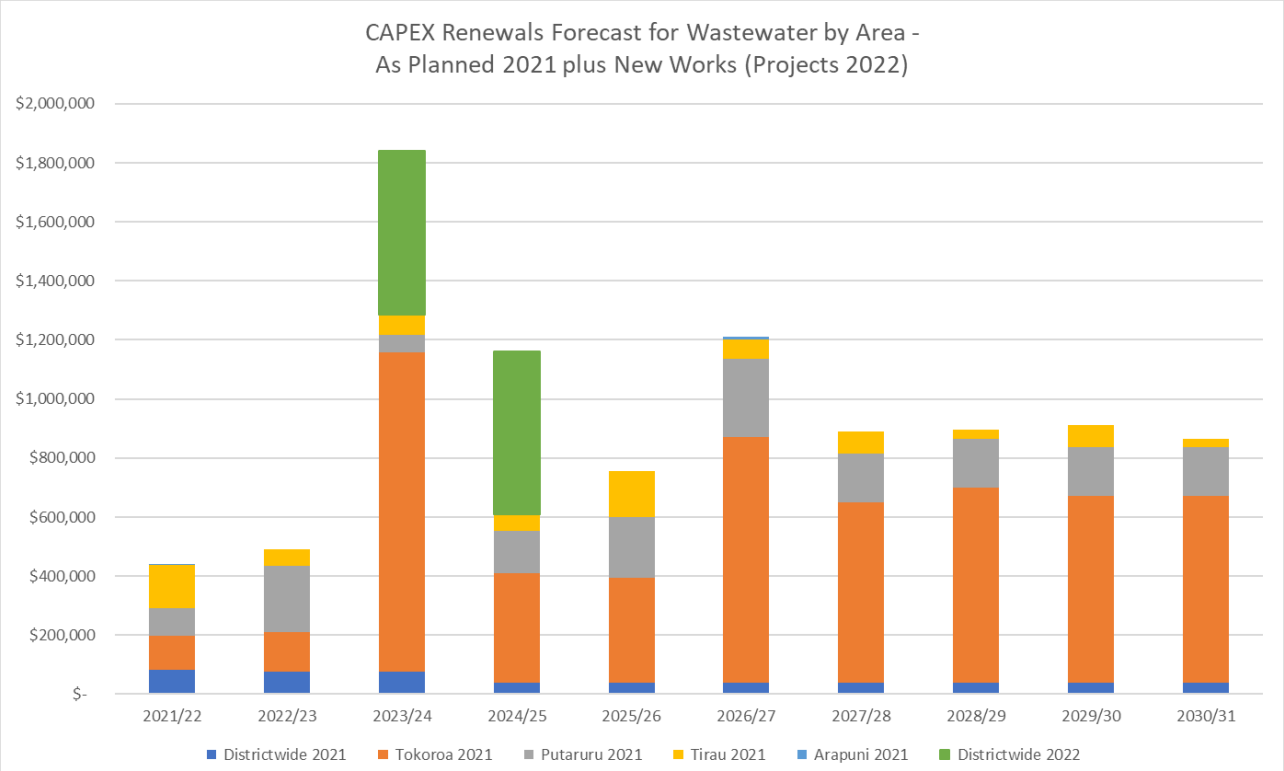
The breakdown of LTP Capital Renewals Expenditure by regional area is as follows.



Capital Renewals Expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtwide	$ 82,000	$ 76,500	$ 76,500	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 515,000
Tokoroa	$ 115,000	$ 135,000	$ 1,080,000	$ 370,500	$ 355,000	$ 830,000	$ 610,000	$ 660,000	$ 630,000	$ 630,000	$ 5,415,500
Putaruru	$ 95,500	$ 223,000	$ 60,500	$ 143,000	$ 206,000	$ 266,000	$ 166,000	$ 166,000	$ 166,000	$ 166,000	$ 1,658,000
Tirau	$ 145,000	$ 55,000	$ 70,000	$ 55,000	$ 155,000	$ 65,000	$ 75,000	$ 30,000	$ 75,000	$ 30,000	$ 755,000
Arapuni	$ 2,500	$ -	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -	$ 12,500
Total	**$ 440,000**	**$ 489,500**	**$ 1,287,000**	**$ 608,500**	**$ 756,000**	**$ 1,211,000**	**$ 891,000**	**$ 896,000**	**$ 911,000**	**$ 866,000**	**$ 8,356,000**

Figure 8.8 Capital Renewals Expenditure by Area

The addition of the capital New Projects in 2022, Community CAPEX breakdown is as shown Figure 8.9. New Capital Renewals Projects occur for Districtwide Wastewater SCADA Upgrade

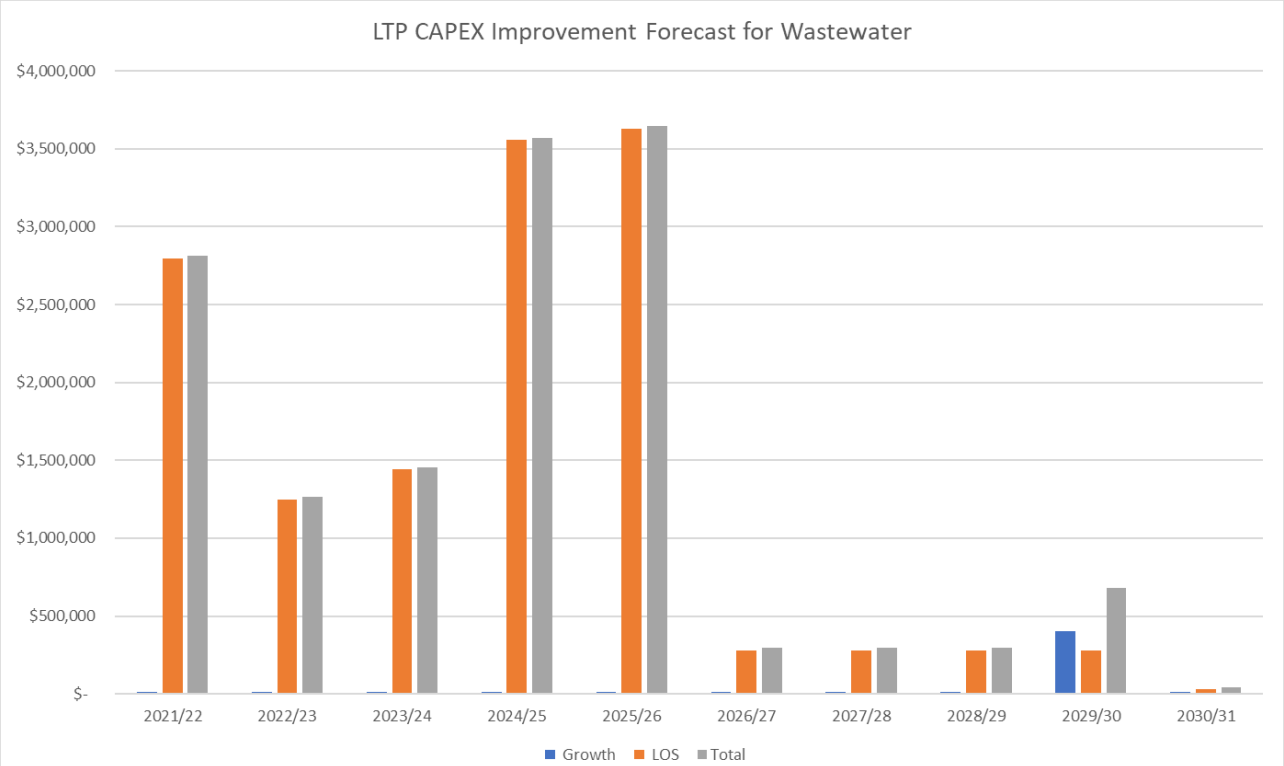


CAPEX Renewals	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtwide 2021	$ 82,000	$ 76,500	$ 76,500	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 515,000
Tokoroa 2021	$ 115,000	$ 135,000	$ 1,080,000	$ 370,500	$ 355,000	$ 830,000	$ 610,000	$ 660,000	$ 630,000	$ 630,000	$ 5,415,500
Putaruru 2021	$ 95,500	$ 223,000	$ 60,500	$ 143,000	$ 206,000	$ 266,000	$ 166,000	$ 166,000	$ 166,000	$ 166,000	$ 1,658,000
Tirau 2021	$ 145,000	$ 55,000	$ 70,000	$ 55,000	$ 155,000	$ 65,000	$ 75,000	$ 30,000	$ 75,000	$ 30,000	$ 755,000
Arapuni 2021	$ 2,500					$ 10,000					$ 12,500
Total 2021	**$ 440,000**	**$ 489,500**	**$ 1,287,000**	**$ 608,500**	**$ 756,000**	**$ 1,211,000**	**$ 891,000**	**$ 896,000**	**$ 911,000**	**$ 866,000**	**$ 8,356,000**
Districtwide 2022			$ 553,125	$ 553,125							$ 1,106,250
Total 2022			**$ 553,125**	**$ 553,125**							**$ 1,106,250**
Total LTP plus New Works	**$ 440,000**	**$ 489,500**	**$ 1,840,125**	**$ 1,161,625**	**$ 756,000**	**$ 1,211,000**	**$ 891,000**	**$ 896,000**	**$ 911,000**	**$ 866,000**	**$ 9,462,250**

Figure 8.9 Capital Renewals Forecast for Wastewater by Area plus New Projects 2022

8.4.4 Capital Improvements Expenditure Forecast

The total LTP Capital Improvements Expenditure by expenditure type is as follows.



CAPEX Improvements	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Growth	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 401,372	$ 15,000	$ 536,372
LOS	$ 2,798,000	$ 1,250,000	$ 1,440,000	$ 3,555,000	$ 3,629,000	$ 280,000	$ 280,000	$ 280,000	$ 280,000	$ 30,000	$ 13,822,000
Total	**$ 2,813,000**	**$ 1,265,000**	**$ 1,455,000**	**$ 3,570,000**	**$ 3,644,000**	**$ 295,000**	**$ 295,000**	**$ 295,000**	**$ 681,372**	**$ 45,000**	**$ 14,358,372**

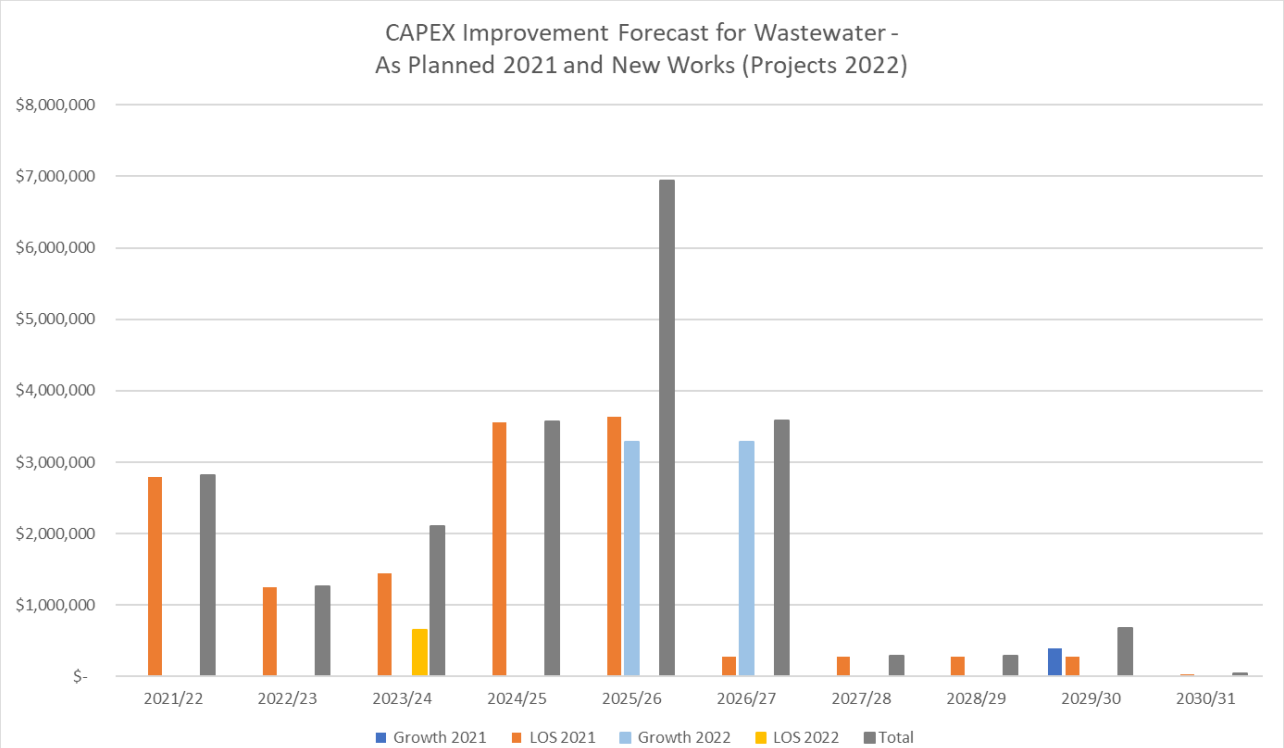
Figure 8.10 Capital Improvements by Expenditure Type

New Wastewater Growth Projects - 2022 include:

- Tokoroa Wastewater Growth Project, $1,303,691 budget for Financial Years 2025/26 and 2026/27 constitutes a major part of the overall District Improvement budget for Financial Years 2025/26 (19%) and 2026/27 (36%).
- Tirau Wastewater Project $1,986,600 budget for Financial Years 2025/26 and 2026/27 constitutes a major part of the overall District Improvement budget for Financial Years 2025/26 (29%) and 2026/27 (55%).
- New Works (Projects 2022) growth projects represent 30% of the total 10-year improvement budget, 47% of the 2025/2026 financial year improvement budget, and 92% of the 2026/27 financial year improvement budget.

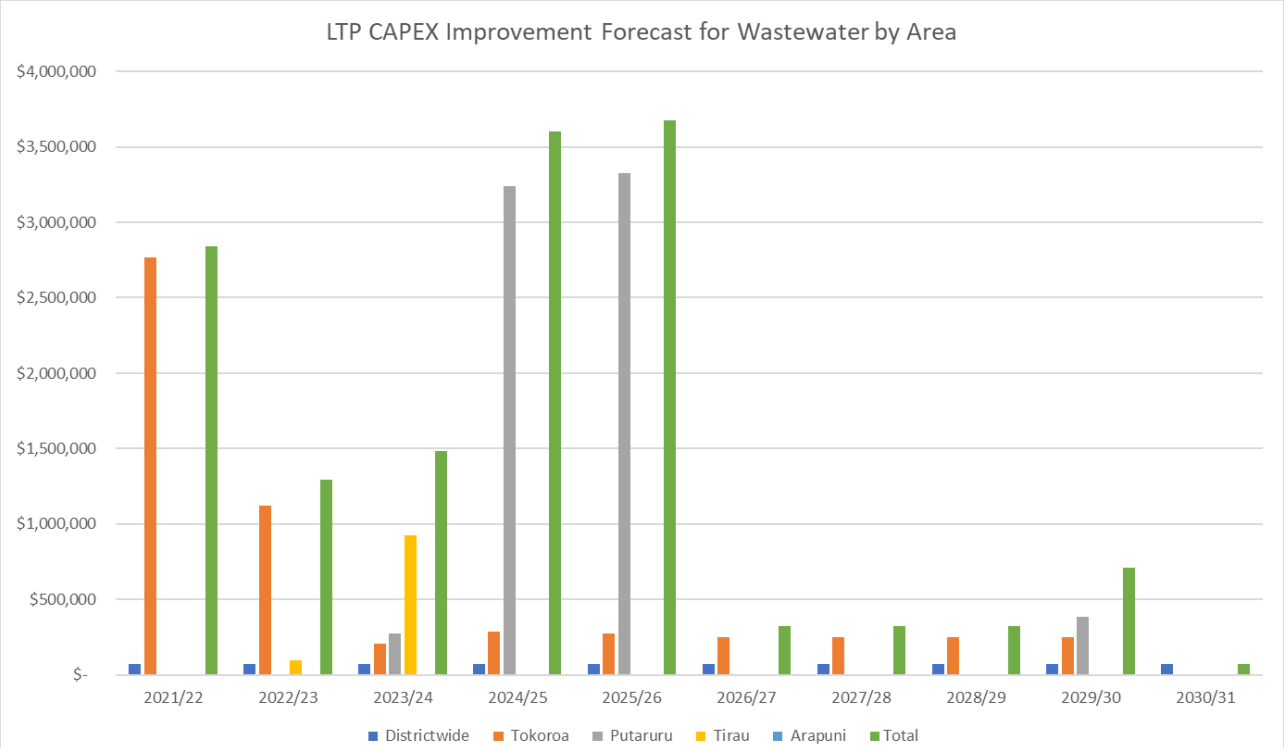
New Wastewater LOS Projects - 2022 include:

- Arapuni Road Wastewater Pump Station, $350,000 budget for Financial Year 2023/24 constitutes a major part of the overall District Improvement budget for Financial Years 2023/24 (17%)
- Tokoroa Ferguson Street Wastewater Main Renewal. $300,000 budget for 2023/24 constitutes a major part of the overall District Improvement budget for Financial Years 2023/24 (14%)
- New Works (Projects 2022) growth projects represent 3% of the total 10-year improvement budget, 31% of the 2023/2024 financial year improvement budget.



CAPEX Improvements	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Growth 2021	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 401,372	$ 15,000	$ 536,372
LOS 2021	$ 2,798,000	$ 1,250,000	$ 1,440,000	$ 3,555,000	$ 3,629,000	$ 280,000	$ 280,000	$ 280,000	$ 280,000	$ 30,000	$ 13,822,000
Total 2021	**$ 2,813,000**	**$ 1,265,000**	**$ 1,455,000**	**$ 3,570,000**	**$ 3,644,000**	**$ 295,000**	**$ 295,000**	**$ 295,000**	**$ 681,372**	**$ 45,000**	**$ 14,358,372**
Growth 2022					$ 3,290,291	$ 3,290,291					$ 6,580,582
LOS 2022			$ 650,000								$ 650,000
Total 2022			**$ 650,000**		**$ 3,290,291**	**$ 3,290,291**					**$ 7,230,582**
Total	**$ 2,813,000**	**$ 1,265,000**	**$ 2,105,000**	**$ 3,570,000**	**$ 6,934,291**	**$ 3,585,291**	**$ 295,000**	**$ 295,000**	**$ 681,372**	**$ 45,000**	**$ 21,588,954**

Figure 8.11 Capital Improvements by Expenditure Type plus New Projects 2022



Capital Improvements Expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtwide	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 750,000
Tokoroa	$ 2,768,000	$ 1,120,000	$ 210,000	$ 285,000	$ 274,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000		$ 5,657,000
Putaruru			$ 275,000	$ 3,240,000	$ 3,325,000				$ 386,372		$ 7,226,372
Tirau		$ 100,000	$ 925,000								$ 1,025,000
Arapuni											$ -
Total	**$ 2,843,000**	**$ 1,295,000**	**$ 1,485,000**	**$ 3,600,000**	**$ 3,674,000**	**$ 325,000**	**$ 325,000**	**$ 325,000**	**$ 711,372**	**$ 75,000**	**$ 14,658,372**

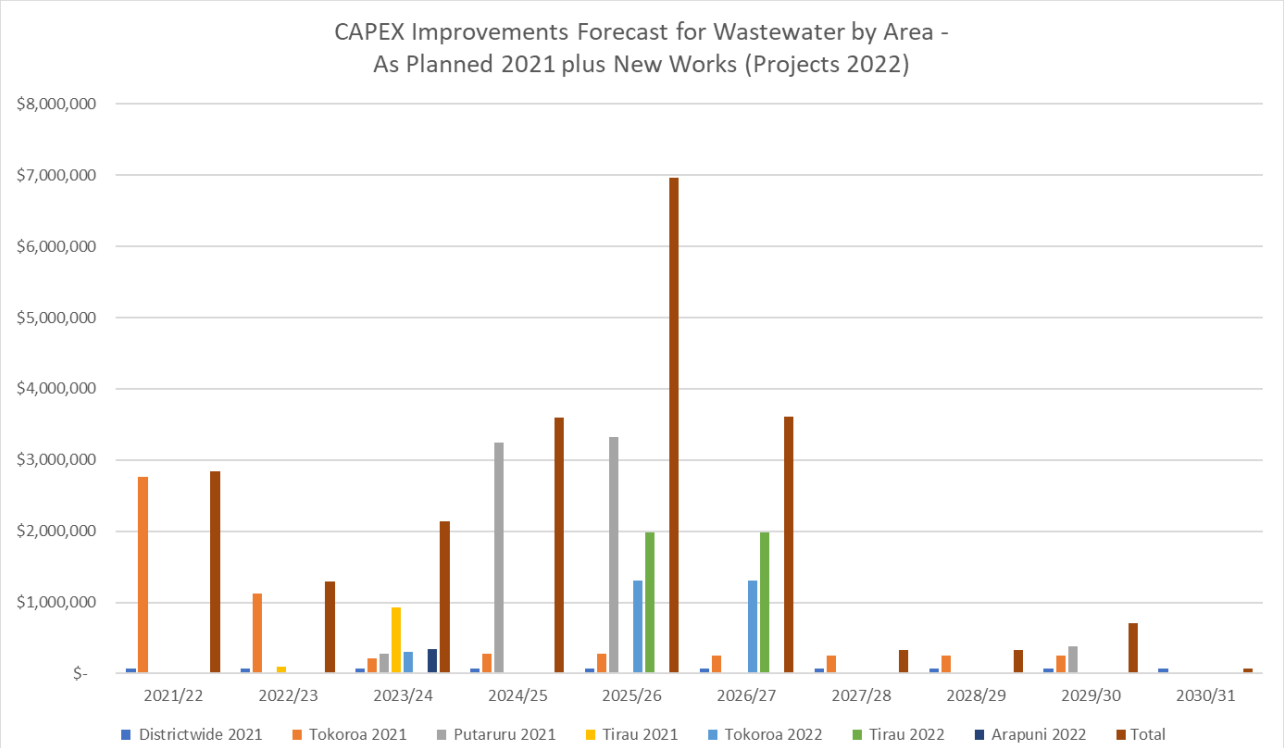
Figure 8.12 Capital Improvements by Area – As Planned 2021

New Improvement Projects planned in 2022 include two Growth projects:

- Tokoroa Wastewater Growth Projects, total cost $2,607,382
- Tirau Wastewater Project, total cost $3,973,200

And two level of service projects:

- Arapuni Road Wastewater Pump Station, total cost $350,000
- Tokoroa Ferguson Street Wastewater Main Renewal. total cost $300,000



Capital Improvements Expenditure	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total Cost 10 Years
Districtwide 2021	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 750,000
Tokoroa 2021	$ 2,768,000	$ 1,120,000	$ 210,000	$ 285,000	$ 274,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000		$ 5,657,000
Putaruru 2021			$ 275,000	$ 3,240,000	$ 3,325,000				$ 386,372		$ 7,226,372
Tirau 2021		$ 100,000	$ 925,000								$ 1,025,000
Arapuni 2021											$ -
Districtwide 2022											$ -
Tokoroa 2022			$ 300,000		$ 1,303,691	$ 1,303,691					$ 2,907,382
Putaruru 2022											$ -
Tirau 2022					$ 1,986,600	$ 1,986,600					$ 3,973,200
Arapuni 2022			$ 350,000								$ 350,000
Total	**$ 2,843,000**	**$ 1,295,000**	**$ 2,135,000**	**$ 3,600,000**	**$ 6,964,291**	**$ 3,615,291**	**$ 325,000**	**$ 325,000**	**$ 711,372**	**$ 75,000**	**$ 21,888,954**

Figure 8.13 Capital Improvements by Area plus New Projects 2022

8.5 Financial Management Processes and Practices

The Council Strategy is detailed in the 2021 LTP integrating Councils Vision, Outcomes and Strategies.

8.5.1 Financial Strategy

The Council Strategy is detailed in the 2021 LTP integrating Councils Vision, Outcomes and Strategies.

The LTP includes Council's Revenue and Financing Policy, which states the Objectives, Principles and Definitions together with policy statements on Rating and Charging methods and other sources of funding. That was followed by a detailed description of each activity and their associated reasons for involvement; methods of service delivery; principal indicators; distribution of benefits; capital expenditure; costs/benefits and funding conclusions.

The implementation of Council's Financial Strategy is detailed in each individual AMP. The AMPs include statements about Funding Policies; Valuation Policies; Expenses; Changes in Asset Valuation; Capitalisation Threshold and Sensitivity Analysis.

8.5.2 Financial Expenditure Forecasting

Figure 8.14 below shows the process SWDC use to finalise expenditure.

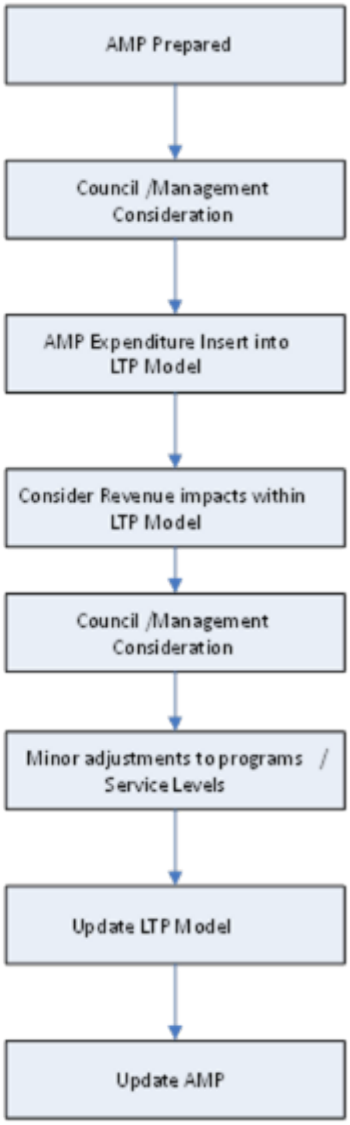


Figure 8.14 Process Used to Finalise Expenditure

AMP budgets were prepared by senior and experienced asset managers. Given the team approach used by SWDC in AMP budget preparations the budgets have been reviewed during workshop and internal review processes by senior managers. The budget setting and review process has been extensive, rigorous, and robust.

8.5.3 Financial Planning, Valuations and Depreciation

AMP budgets are prepared by senior, experienced asset managers. Given the team approach used by SWDC in AMP budget preparations the budgets are reviewed during workshops and internal review. The budget setting and review process is extensive, rigorous, and robust.

Budgeting for renewals of ageing infrastructure is analysed using a spreadsheet that takes account of all relevant data (including the age, remaining useful life, material, quantity, capacity, replacement cost), to calculate the depreciation funding required over a period of decades. The model allows the criteria to be amended to determine the sensitivity of the assumptions and assists long term planning to "smooth" the peaks in the work programme and associated funds required.

Infrastructure asset valuations are reviewed and updated every three years to take account of changes in the quantity, age, condition, remaining useful life and replacement cost. The process includes independent review of the accuracy of the data held in the asset management systems (AssetFinda and RAMM) and includes comparison of replacement costs with those used by similar councils.

8.5.4 Changes in Asset Valuation

The costs associated with renewing assets and providing new or improved asset infrastructure are capitalised and depreciated in accordance with the assessed economic life of each asset. This applies also where a developer provides infrastructure to be taken over as public assets by Council. Costs of growth are currently met by developers, with any cost effect on Council assessed as not material. Growth costs therefore may be identified by the Vested Assets projections given and are self-balancing.

8.5.5 Capitalisation Threshold

The capitalisation threshold for Wastewater assets has been set at $5,000. The cost of an asset must be greater than $5,000 to be capitalised. A lower threshold for assets can be used where determined by the budget manager in consultation with the Finance team, and where the value of an individual item is less than the threshold. However, if the item is part of a group of similar items, these may either be expensed or be capitalised at an aggregated amount.

Maintenance is work done that is of an operational nature that neither increases the value nor extends the remaining life of any asset.

Renewal is improvement work done, (including plant, labour, materials, and professional services used), on an existing asset that increases its depreciated replacement value by more than $5,000 and extends its remaining life. The cost of renewal is a capital expenditure that must be recognised by an appropriate adjustment in the Asset Register. The renewed value in the AssetFinda Register cannot exceed the optimised replacement value of the asset.

Replacement is work done (including plant, labour, materials, and professional services used), to replace an existing asset that is recorded in the Asset Register. The cost of replacement must be greater than $5,000, unless where the value of an individual item is less than the threshold, but the item is part of a group of similar items, these may either be expensed or be capitalised at an aggregated amount. The corresponding capital expenditure is recorded in the Asset Register as a new asset and is uniquely identified. If the asset replaced is discarded or sold it must be removed from the Asset Register and any residual value must be formally written off.

An addition to the Asset Register is required when a new asset is created with a value (including plant, labour, materials, and professional services used) that exceeds $5,000. A new asset must be uniquely identified, and the record in the Asset Register requires an assessment of the asset's remaining life expectancy or straight-line depreciation rate.

Where the asset register recognises an individual component worth less than $5,000, or where a length of pipe greater than 12 metres is replaced, the threshold does not apply, and the additional value is capitalised.

8.6 Current Valuation

The following table summarises the latest valuation, to June 2022. The optimised replacement cost and base life assigned to each asset were determined by Council staff and was initially peer reviewed by Opus International Consultants. The resulting figures have been applied to Council's AssetFinda database to derive the valuation and depreciation. Valuations will be updated every three years.

The notations "lines", "points", and "plants" refer to the broad classification of asset types within the AssetFinda database. In the sewerage activity:

- "Lines" mean sewer pipes and mains
- "Points" mean the end point of each section of pipe, normally manholes
- "Plants" mean all the other structural, mechanical, electrical asset components

Town	Replacement Cost ($000) 30/06/2008	Replacement Cost ($000) 30/06/2010	Replacement Cost ($000) 30/06/2013	Replacement Cost ($000) 30/06/2019	Replacement Cost ($000) 30/06/2021	Replacement Cost ($000) 30/06/2022
Tokoroa	$30,868	$31,320	$41,581	$48,353	$51,708	$88,004
Putāruru	$11,372	$11,144	$13,784	$16,204	$18,214	$25,976
Tīrau	$4,340	$4,679	$5,597	$6,140	$6,731	$8,773
Arapuni	$892	$931	$1,259	$1,439	$1,621	$2,214
Total	**$47,472**	**$48,074**	**$62,221**	**$72,136**	**$78,274**	**$124,967**

Table 8.2 Summary of Wastewater Assets Replacement Costs

8.7 Key Assumptions

The current valuation and renewal profiles are based on the best Engineering assessment of the current assets value, condition, and performance.

The Asset Register is currently the AssetFinda database. Summary data from AssetFinda is supplied to the Fixed Asset Database (NCS) managed by Corporate Support.

8.7.1 Asset Condition

In the case of sewers, the condition of the pipe is assumed as average (3) unless better information is available. The different types of pipe have been attributed various average life expectancies.

This method of describing condition of underground assets will be used until such time as a better one is available. “Critical” lengths of pipe have been identified and sample lengths examined by video to establish condition. The adopted age/condition relationship should ensure that Council adequately provides for minimising decline in service potential in any one year. The sewers in Arapuni are the only assets approaching their expected “useful life” of 80 to 90 years, and closer inspection during the planning period will establish if any sewers need repairs, upgrading or renewal.

8.7.2 Improved Level of Services

At present there are a number of wastewater plants that are not connected to Councils Telemetry system, we have budgeted to connect these pump stations, so we have improved control of these pump stations.

8.7.3 Wastewater Consents Funding

As Council is still in the process of consulting with Iwi on the renewal of our Wastewater Consents, it has been decided to add placeholder budgets into the AMP. A capex figure of $2.5 M per year has been added for years 3-10 and $500,000 per year for operations for years 4-10.

8.7.4 Above Ground “Plant” assets

Plant assets have a large variety of useful lives and operating conditions, so most of the annual renewal programmes are centred on the prudent replacement of assets that demonstrate declining performance and reliability.

In assembling the plant replacement programme, and checking data for the revaluation, it has been necessary to re-check the inventory for useful lives and cost. There also have been extensions of individual assets to sub-component level so that significant asset items are recognised separately.

8.7.5 Replacement Needs Cost

The Capital Renewals shown in the following figure have been derived from the Council’s Assets register in 2021. The cost of renewals over the plan period can be seen in the chart.

Figure 8.15 Capital Renewals Needs

The figures for reticulation and plant have been derived directly from the asset register and are not inflation adjusted.

It will be noted that the capital and renewal costs projected in this chart are not fully budgeted for in the AMP/LTP budgets for the reasons outlined in Section 5.

Unit replacement costs for common line and point assets were calculated from actual installed costs. Assumptions included:

- All pipeline replacement would be carried out using modern pipe materials by construction methods commonly in use today, i.e., open cut trenching, hydraulic thrusting etc. It was assumed that pipes smaller than 300 mm diameter would be renewed in “plastic” (uPVC/mPVC/HDPE etc), but larger sizes (300 mm dia.+) would be renewed in conventional reinforced concrete pipe
- The construction environment assumed is ‘brown field’ i.e., replacement of existing, rather than green field construction with associated higher costs of consultation, consent, etc
- Replacement costs for all wastewater assets increased by 1.3% over the two-year period ending 30th June 2010. Pipe assets reduced in value by 8% due to falling prices during the GFC, offset by modest increases of 6% for “plant” assets, and 15% for “point” assets (especially manholes) during the two-year period.
- An engineering on-cost of 10% has been included in these rates. Unusual pipe sizes in the reticulation would be replaced by the next larger size. No other optimisation or efficiencies in pipe sizes or lengths have been allowed for in replacement costs.

8.7.6 Depreciated Value and Life Expectancy Policy

Straight-line depreciation has been adopted for all wastewater assets and optimised depreciated replacement costs (ODRC) have been calculated. The remaining lives over which assets are depreciated are shown for each asset and have been assessed by taking account of the various factors that have affected the particular asset’s base life expectancy, in accordance with the IIMM.

The following life expectancies were used to calculate depreciated values for sewer pipes:

Table 8.3 Typical Pipe (“Line”) Material Base Lives

Pipe Material	Base Life (2013)
RCRRJ	85
Glazed Earthware	80
mPVC	90
Steel	80
uPVC	80
mDPE	90

The following life expectancies were used to calculate depreciated values for ‘point’ fittings. Changes from previous valuation are shown against each type. These indicate a more conservative approach based on experience with repairs and replacement of the fittings.

Table 8.4 “Plant” Base Lives

Asset Type	Base Life (2016)
Air valve	50
Electrical	25
Manholes	80
Pumps	20-30

Asset Type	Base Life (2016)
Control Equipment	25

These useful lives were derived from published data from other Councils, the International Infrastructure Management Manual modified by deterioration failure records, and observations by Council employees. Other values for pumps, treatment plant components, electrical and telemetry assets were checked and adjusted, as necessary, during the 2013 valuation.

Base life values were deemed to be accurate enough for the 2019 asset valuation.

8.8 Other Assumptions

- All expenditure is stated in 2020/21 dollars, with no allowance for inflation over the planning period
- All costs and financial projections are GST exclusive
- Operational costs are generally shown to increase in proportion to total demand and anticipated real energy price increases
- Renewal costs are based on the plans outlined in Chapter 5
- New assets requirements have been derived from analysis of service level changes, growth, and risk
- The costs of insurance and risk mitigation are included in the forecasts, however the potential costs that could arise through exposure to risk are not
- Climatic and other environmental trends are expected to largely continue as they have in the past
- Population and Households growth is assumed to be growing by 0.3% in Tokoroa and 1% in Putāruru, Tīrau, and Arapuni.
- This Plan assumes no growth in commercial/industrial demand
- Asset values and lives have been taken from the 30 June 2019 valuation.

8.9 Confidence Levels

The degree of reliability of the data used in this plan affects confidence and margin of error in the projected renewal programmes and other financial estimates.

Data confidence for the assets covered by this plan has been expressed below in terms of the NAMS Group approach:

Table 8.5 Confidence Grading Table

Confidence Grade	General Meaning
A	Highly Reliable Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment
B	Reliable Data based on sound records, procedures, investigations, and analysis, documented properly but has minor shortcomings, for example the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some
C	Uncertain Data based on sound records, procedures investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data is available
D	Very Uncertain Data based on unconfirmed verbal reports and/or cursory inspection and analysis

Table 8.6 Assessment of Confidence in Key Inputs to Programmes

Assessment of Confidence in Key Inputs to Programmes					
	Attribute	**D Very Uncertain**	**C Uncertain**	**B Reliable**	**A Highly Reliable**
1	Unit cost for Replacement				
2	Condition/Remaining Life:				
2a	*Above-ground Civil, Mechanical & Electrical*				
2b	*Buried Components*				
3	Asset Size				
4	*This field removed*				
5	Material				
6	Date of Installation				
7	Asset Type				
8	Location				
9	Length (pipelines)				
10	Quantity (other assets)				
11	Deterioration Rates:				
11a	*Above-ground Civil, Mechanical & Electrical*				
11b	*Buried Components*				
12	Asset Performance				
13	Demand Information				

Notes:

2, 6, 11b: While condition, remaining life, material, and installation date and deterioration rates are not as accurate as desired, faults frequency generally demonstrates that within this ten-year plan period, buried components are unlikely to require significant renewal. Depreciation rates have been conservatively set, so that in future plan periods there should be adequate funding to sustain a renewal programme based on better data.

Notes:

- Reliability of revenue cannot be greater due to status of population predictions and potential decline in population
- Accuracy of Depreciation cost is medium due to some uncertainty of asset life, but has been set conservatively to compensate in the medium term
- Confidence in renewal costs over the plan period is higher than that in the depreciation figures because of observed reliability performance of buried assets

9 Processes and Practices

This section describes how SWDC manages its asset infrastructure in an integrated manner.

9.1 Management structure

The following organisational structure outlines the responsibilities and linkages between the Group Managers.

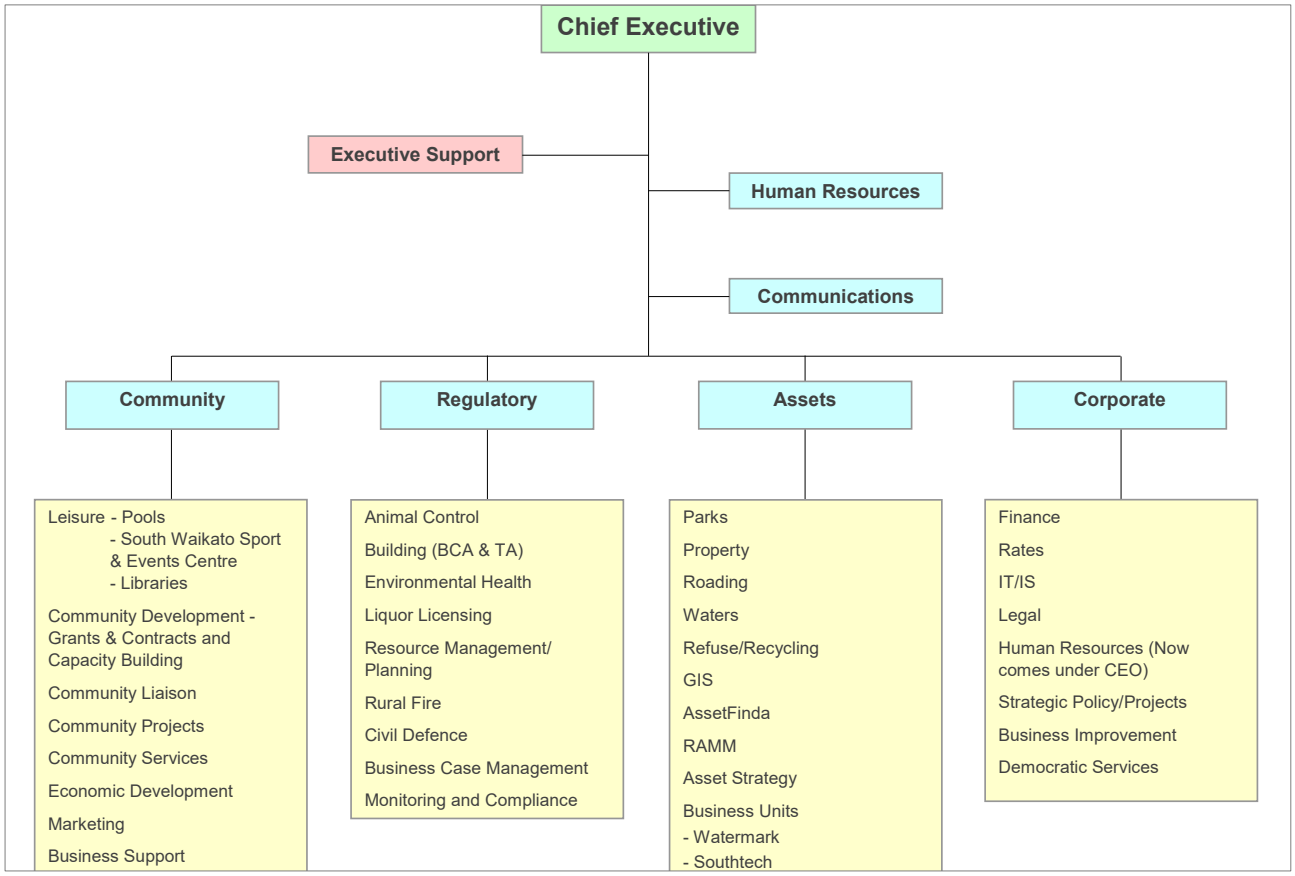


Figure 9.1 Organisational Structure

9.2 Responsibilities for Asset Management Outcomes

Council's infrastructure assets are managed by the Assets Group.

The Group Manager, Assets is responsible for managing the infrastructural assets that provide the services of Land Transport, Water Supply, Wastewater, Stormwater, Refuse Landfills and Community Facilities and Property. This responsibility includes:

- Ensuring that infrastructure is provided and maintained in a manner that it is capable of delivering the agreed Levels of Service and complies with resource consent conditions
- Planning and long-term budgeting of capital, operating and maintenance requirements
- Monitoring Levels of Service provided by the assets
- Identifying and managing asset and service-related risk
- Reporting of Level of Service, Key performance indicators and Risks at asset level
- Achieving Asset Management practice defined in the Asset Management Policy
- Asset Strategy - Coordination of asset management plans and improvements

9.3 Business Processes

9.3.1 Asset Management Systems (AMS)

SWDC operates two separate asset management systems for maintaining an up-to-date inventory of assets, expected useful lives, age, condition and performance assessment, renewal timeframes, installed cost, replacement cost and maintenance history.

- AssetFinda is used for the 3 Waters, Landfill, Parks, and Property assets
- RAMM (Road Assessment and Maintenance Management) is used for Land Transport assets.

AssetFinda is a cost-effective solution for a number of smaller councils in NZ.

AssetFinda is used to manage and produce asset inventory reports. It is integrated with the MapInfo data tables to permit input, querying, reporting, and financial modelling using the asset register data. Reports can be produced for high level asset groups (“lines, points and plant”), monthly depreciation for additions and deletions as well as summaries since the last revaluation. Asset Group data can be filtered from the standard report by output to, and manipulation in, a spreadsheet.

The default valuation process used by AssetFinda is capable of recognising asset condition, extending the life of the asset if appropriate, and recalculating revised depreciated value and annual depreciation.

AssetFinda is reviewed, upgraded, and extended from time by the vendors, to meet the requirements of the users.

Financial Management

SWDC operates the NCS (Napier Computer Systems) corporate financial management software, which has been developed specifically for local government planning, operational and reporting purposes. NCS does not store or compute asset management information but could be used to determine the number of properties billed for rates for checks against connections to the infrastructure shown in GIS.

NCS currently holds the Fixed Asset Register and Property related data. The Fixed Asset Register, which is part of the NCS Accounting software, holds the valuation information for buildings and depreciation of buildings is calculated using NCS. Depreciation for the 3 waters assets is calculated using AssetFinda.

Each of the asset infrastructure groups has its own cost centre in Council’s accounts. The income from fees and charges and the costs of maintenance, operation and capital improvements are accrued to the group to which they apply.

Document Management

SWDC operates the ECM electronic document software for storing documents.

Historical paper drawing records are stored in secure filing cabinets with an electronic catalogue, while more recent CAD drawings are stored electronically in a network drive.

Resource Consent Management

CSVue is used to record resource consent information issued by the Waikato Regional Council and to manage the relevant consent compliance monitoring and reporting requirements. The software also provides alerts for actions that are required. Relevant consent documents are stored in ECM.

Geographical Information System (GIS)

The Assets Group operates a GIS to display and manage core infrastructural asset data held in the Asset Management System.

The GIS provides the following functionality:

- The spatial component (geometry) of AMS data is be created, deleted, or edited.
- Displays asset data as map feature layers for internal and external users.
- Map features can be queried to retrieve feature attributes, and spatial relationships between layers can be analysed.

- Non-asset data layers such as property parcels, road centrelines (CRS), building outlines and aerial photography is available.
- Property layers linked to Council's rates and valuation systems can return owner and land information.
- Provides a link between Map features, as-built drawings and other documents held in Council's document management system.

There are standard operating procedures to ensure that the GIS database is maintained up to date, and to ensure that correct information is given out to users of the database.

GIS data is updated as shown in the following process chart.

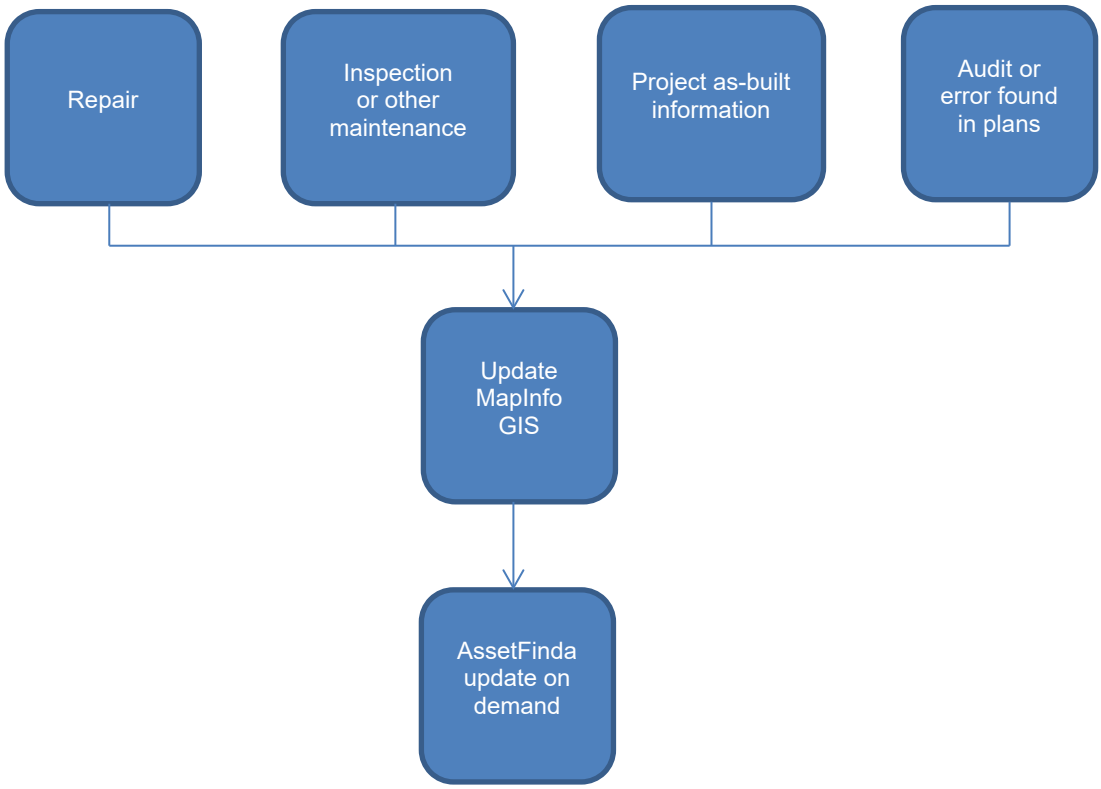


Figure 9.2 GIS Update Process

9.3.2 Key Information flows and processes

Key information flows and process linkages include:

- Developing the LTP including the Public Consultation phase (from which the Council Outcomes are derived)
- Translating the Council Outcomes into detailed levels of service and performance measures that can be embodied in fixed assets, processes, and contracts for service
- Identifying future demand and then planning appropriate capacity increases
- Identifying and planning upgrades to comply with legal requirements or to improve performance
- Preparation of long term and annual budgets, and associated on-going reporting
- Establishing service level agreements with Southtech and Watermark business units
- Developing contract specifications and standards, and then engaging external contractors through prescribed procurement processes
- On-going management of those contracts and service level agreements

- On-going compliance monitoring and reporting of environmental performance
- Responding to customer requests for service and complaints

These key information flows and process linkages are shown diagrammatically below. Also refer the Corporate Performance Management Framework (DocSet 289107)

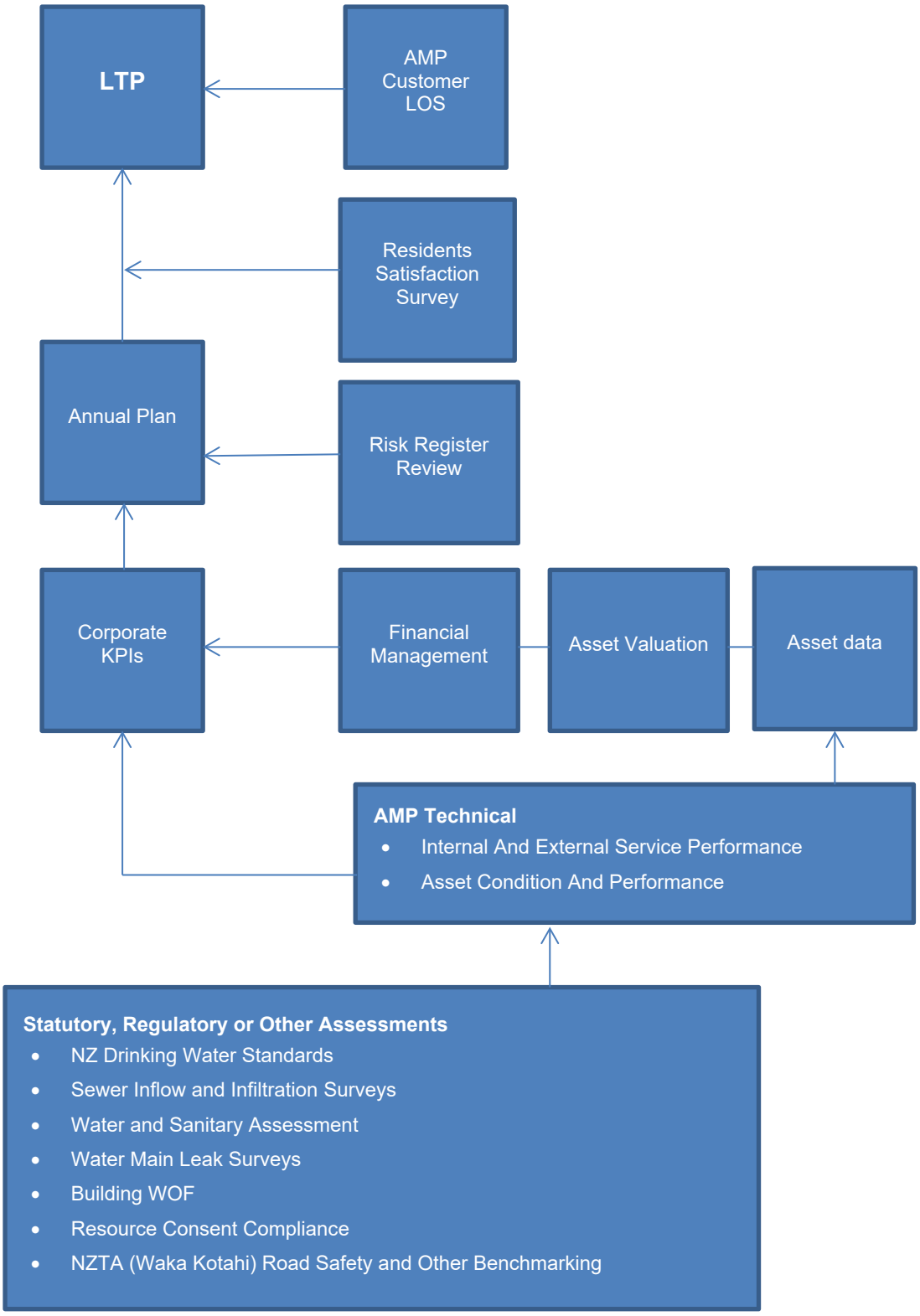


Figure 9.3 Performance Management System Hierarchy

Table 9.1 Key Asset Processes

Process	Utilities
Procurement	• Professional Services are obtained from Council's Services Business Unit • Water and wastewater maintenance activities are carried out by Council's Watermark Business Unit, via annual Services agreements • Stormwater maintenance activities are carried out by an external contractor, arranged through competitively tendered contracts.
Expenditure Decision-making	• Formal processes have still to be developed. This will require the development of guidelines and indicators which trigger the desired response, and rank projects according to risk, financial capability, and optimised life cycle costing. These processes will include: • Trigger Point for Renewal • Trigger Point for Extension or New Capacity • Evaluating/Prioritising Projects • Evaluating/Prioritising Renewal Projects • Evaluating/Prioritising New Works Projects
Asset Operation & Maintenance	• The following processes are used for maintaining and operating water assets: • Standards as described in the Levels of Service, Maintenance Contract Specification and Service Agreements • Operating Standards as defined in the operating procedures (SOPs) • Maintenance Standards and policies defined in Watermark procedures are established by reviewing the performance and cost of maintenance work • Routine (programmed) maintenance check inspections are carried out for critical assets

Process	Utilities
Asset Renewals	• The following processes/practices are used for renewing assets: • Rehabilitating existing assets were economical • Condition assessment • Asset criticality Matrix criteria • Financial treatment of renewal-projects • Most plant renewal is reliability-driven • Current criterion for renewal of network pipes is a failure rate greater than or equal to two breaks per year for two consecutive years in any individual residential block
Constructing/ Vesting of New Assets	• Procedures are used for: • Constructing New Assets, particularly where demand for additional capacity may arise from commercial customers and where upgrades are driven by consent conditions • Vesting assets to Council, most likely to occur in the case of subdivision • Existing Assets to be bought by Council, however this is not expected to happen
Disposal of Assets	• Procedures are used for the following: • Trigger point for decommissioning • Issues to be considered for disposal as outlined in the LGA 2002
As-Built Records	• The AssetFinda inventory largely relies on information from Council's maintenance contractors, as-built records of new works and results of monitoring and testing activities. Fieldwork recording sheets and processes to ensure the records are updated in the asset register and GIS, have been put in place. The sheets identify any existing asset that is being renewed or replaced and record the details necessary to fully update the asset register or the GIS system as appropriate

Process	Utilities
Quality Management	• Management is guided by the requirements of the following: • Drinking Water Standards of New Zealand • Health (Drinking Water) Amendment Act • Generally accepted accounting practice - NZ IAS 16 • The International Infrastructure Management Manual • Council Asset Management Policy • Resource Consent Conditions • Council Health and Safety Plan • Council Quality Assurance Documents • Standard Operating Procedures and Operations Manuals • Requirements include: • Water Supply Testing and Monitoring, A programme of source, treatment point and distribution system water sampling and testing is operated • Treatment Management, the source water is pre-treated • Storage and Reticulation Management for Water Quality • Council's Stormwater Management Plan (SMP) is a key document and a companion reference to this Asset Management Plan. It identifies the issues, values and opportunities associated with urban stormwater. It covers management of stormwater discharge volume and quality and discusses options for treatment and control. Planning tools that provide the basis for management, and details of the legal framework are discussed in the SMP • Wastewater treatment and disposal is in accordance with consent conditions
Performance Management Process	• Monitoring and reporting of service levels • Monitoring and reporting of consent compliance • Public Health monitoring QA system via Standard Operating Procedures • Monthly and quarterly Management Reporting

9.4 Monitoring and Reporting Performance

Monitoring of performance and service delivery is achieved by various means, including:

- Service delivery, service requests, projects, performance measures and KPIs are reported six-weekly to Council.
- Resource consent compliance reports are submitted to the regulatory authority (Waikato Regional Council)
- Drinking water quality test results are submitted to the District Health Board
- Roading reports are submitted to the funding authority (Waka Kotahi NZTA) - including condition rating, traffic data and the annual Achievement Report
- Financial performance is reported monthly to Council

Further details are provided in the respective activity AMPs.

9.5 Quality Management/Confidence

Data quality in AssetFinda is audited randomly to verify the existence and location of particular assets, as well as the condition, where the items are visible.

Samples are taken from the ageing asbestos cement water pipe samples and analysed to determine their condition and assessed remaining useful lives then recorded in AssetFinda to improve confidence in planning the replacement programme.

More detailed verification is required and independently reviewed for the triennial asset revaluations, at which time the remaining useful lives and replacement costs are updated.

New construction and renewal/replacement items are recorded in AssetFinda, following the capitalisation process, which includes all related project costs such as investigation, reporting, consenting, design, procurement, installation and supervision. As-built information is provided by the contractor.

10 Asset Management Improvement Plan

10.1 Asset Management Plan Improvement Process

Council has been actively committed to effective asset management since the mid 1990's. This commitment has included in-house production of asset management plans since 1998, implementation of asset management systems and associated data collection.

During the period 2004-2006 Council's AMPs were updated to meet requirements of the Local Government Act 2002 and progress with asset management practice was incorporated into the plans. Resulting from the analysis in the 2008 AMPs an asset management improvement programme was implemented.

South Waikato District Council completed a formal assessment of appropriate asset management practice in 2008. The report "South Waikato District Council - Selecting the Appropriate AM Level" was prepared by Waugh Infrastructure Management. The report used a structured process to determine the appropriate level of asset management, using guidelines provide in the IIMM.

The report recommended that the "core plus" level of asset, management was appropriate for all of the activities. Based on the value of our assets and the maturity of our asset management practice, and the reports recommendation, Council adopted in the Asset Management Policy 2008 a target level of "core plus". Since this time the International Infrastructure Management Manual 2015 (IIMM 2015) has renamed "core plus" as "intermediate". Every 3 years in synchronicity with the LTP process we reassess progress towards the goal of "intermediate" level.

10.2 Review of asset management practice

Draft versions of the Council's AMPs were sent to Waugh Infrastructure Ltd for independent external review. The results of their review as reported in draft form as "Water Supply, Wastewater, Facilities & Community AMPs, AMP Compliance Reassessment - December 2014"

The assessment reviewed the AMP's progress toward the target level in terms of the 12 areas defined in IIMM. Overall Waugh's assessment indicated the AMPs require some additional work to meet the target compliance level and compliance with local government legislation (LGA 2002).

The review highlighted areas where the AMP's need more work and identified gaps in our documentation of what we do to manage the assets. A series of improvements to be undertaken to rectify omissions and gaps in our documentation have been consolidated into the 8 areas as set out in the improvement plan outline.

10.3 Current and target asset maturity

The New Zealand Treasury has created an asset management maturity assessment tool to allow organisations to measure the extent of the maturity of their asset's management practice to meet the current and future needs of the organisation.

The asset maturity tool is based on the requirements of the IIMM 2015. The tool is provided in the following pages and shows the improvement projects planned for the next 5 years and links to the IIMM 2015. This should be updated to the use of the latest IIMM 2020 Online version.

The table also shows the timing and resources required for each task. These tasks will be implemented and monitored over the next 3 years.

10.4 Asset Management Plan Improvement Plan

Council has developed the following AM practice improvement programme. AM Improvements in the table below will be in the context of the following issues

- The impacts on operations and management, asset ownership, risks, and financial requirements of the Government-led water reform, including the final outcomes of the Water Services Bill and establishment of Taumata Arowai. These may impact the financial, operational and asset ownership of wastewater services in the District.
- The impacts on operations and management, risks, and financial requirements relating to COVID and associated with wastewater services. This includes changes to business and household usages, financial impacts affect users' ability to pay for services, and COVID restrictions on Council and contractor's operational capabilities.

Table 10.1 Asset Management Improvement Plan

IIMM Reference	AM Maturity Area	Improvement Task 2022	Resources Required	Comments
2.0	**Understanding and Defining Requirements**			
2.1	AM Policy and Strategy	Update Asset Management Policy (last update was in 2008)	In-house	To be completed for next AMP/LTP update 2021. Practices to be aligned to the use of the latest updated IIMM 2020 Online version of best industry practice guidelines
		Sustainability policy development	In-house	Strategic Policy Team to develop
2.2	Levels of Service and Performance Management	Improve customer knowledge and understanding of demand for Wastewater services	$/year	Council needs to collect updated information and data for each of the regional areas on population, number of properties connected. This can be achieved through implementing customer measures i.e., surveys, track counters and recording requests for service. Improve understanding of asset performance through implementing technical performance measures.
		Level of service review and consultation, and knowledge of customer service expectations and performance. Collect information on incidents, failures and callouts by each of the four community areas	In-house	Understand Council's performance with respect to customer service, including incidents past and current call out statistics and failures from reported customer incidents. Consultation on the LOS should occur at the same time as the LTP consultation. This will need to be internally resourced and will involve asset, GIS services, and asset managers. Estimate 6 to 8 person-weeks minimum dependent on the level and depth of review sought.

IIMM Reference	AM Maturity Area	Improvement Task 2022	Resources Required	Comments
2.3	Demand Forecasting	Update Population demographics analysis before the next AMP update	In-house	To be completed before the next AMP and LTP update for infrastructure activities (2021)
		Develop a non-resident demand trend for the district		
		Investigate economy driven demand trends		
		Update demand forecast for the activity	In-house	
2.4	Asset Register Data	Ongoing review of useful lives and unit rates to ensure correct renewal programmes and asset replacement values. Revise asset types.	In-house	Implement improvements identified in the 2018 revaluation.
2.5	Asset Performance and Condition Assessment	Develop and document an asset performance assessment programme	In-house	Using IIMM framework. Align with LOS and performance measures
		Record Park's assets condition data.	In-house	
		Undertake condition assessment on a 3 yearly cycle.	In-house	Currently undertaken.
		Determine the minimum condition grade for each asset component	In-house	
		Asset data quality confidence.	In-house	The assets' location and other physical data are audited randomly to determine the accuracy of the information stored in AssetFinda. Triennial revaluations of the infrastructure are independently reviewed. The reviews include comparison of replacement costs with other Councils to improve confidence in our financial estimates for renewal and replacement.
		Electronic recording of asset condition and assessment	In- house	Budgets have been identified in the current LTP to implement the AssetFinda via mobile technology and is expected to complete in the first quarter of 2022.
3.0	**Lifecycle Decision Making**			

3.1	Decision Making	Develop a spreadsheet model that is intended to produce long term (>50 years) estimates of renewal expenditure cycles, based on consideration of different assumptions regarding useful lives, replacement costs and timing.	In-house/ consultant	Asset Managers have been working with the Finance team and a consultant to develop this model. The model will assist in identifying and avoiding significant peaks and troughs in the replacement programme and will indicate the level of depreciation funds that will need to be accumulated to allow the work to continue. Completed but not utilised in AMIS, only finance use this analysis
3.2	Risk Management	Update risk management policy and procedures in alignment with latest NZ standard. Document risk management strategies and processes for critical assets	In-house	
		Identify and develop a management plan for Critical Assets.	In-house	A Criticality assessment was carried out in 2008 and is now considered to be unreliable. This task is intended to be undertaken during the current AMP period.
		Develop an emergency response procedure Development of a business continuity plan	In-house	
		Extend risk management to include assessment of failure probability in Waters assets, to enable completion of risk profile		
		Update risk assessment for all assets within the activity		Extend risk management to include assessment of failure probability in Waters assets, to enable completion of risk profile
		Extend risk management to include assessment of failure probability in Waters assets, to enable completion of risk profile		
3.3	Operational Planning	Services staff are working with the vendor to develop the maintenance tracking module in AssetFinda	Consultant	
		Optimise the reactive versus planned maintenance schedules and budgets for building assets	In-house	
3.4	Capital Works Planning	Develop systems to promote good decisions based on "whole of life" asset management Improve valuation processes	In-house	
3.5	Financial and Funding Strategies	Develop project plans prior to financial year start	$ / consultant	

4.0	**Asset Management Enablers**			
4.1	Asset Management Teams	Undertake an asset maturity assessment *(Source: http://www.treasury.govt.nz/statesector/investmentmanagement/review/icr/information/assetmgmt)*	*In- house*	An asset maturity assessment is required to be carried by staff; this will allow the Waters asset managers to understand the current rating against the anticipated target to be achieved within the activity.
4.2	Asset Management Plans	Update AMPs according to the IIMM guidelines		
4.3	Management Systems	Document asset management procedures	In-house	This will be done corporately
4.5	Service Delivery Mechanisms			
4.4	Information Systems	Develop Waters Layer for GIS and plot all Waters assets	In-house	To be completed before the next AMP and LTP update (2021)
		Develop GIS capabilities to support Asset management systems (AssetFinda)		Develop and use GIS capabilities to support to deliver proposals above
4.6	Audits and Improvement Planning	Monitor and report on this improvement plan	*In- house*	

10.5 Achievements and future improvement programme

10.5.1 Quality of asset information and confidence

Further work is planned to develop the "Condition" and "Performance" characteristics in AssetFinda to improve confidence in assessing remaining life. This is particularly useful for underground assets that cannot easily be examined. Not yet completed.

The assets' location and other physical data are audited randomly to determine the accuracy of the information stored in AssetFinda. Not yet completed.

Details of new assets are provided by the contractors installing them, as part of their contractual responsibilities. Not yet completed.

Details of the individual components in ancillary buildings are scheduled separately in AssetFinda, indicating the description, assessed useful life, installed cost and replacement cost. These are to be reviewed and updated

10.5.2 Planning Assumptions

Documented in all AMP's. Completed.

10.5.3 Demand management

Council will implement a flow gauging and hydraulic modelling of wastewater network to assess the hydraulic capacity and how much of the capacity is being used by the total demand from return of portable water from leakages, ground water infiltration and ingress of rainwater during heavy rainfall event. The calibrated hydraulic model will enable the Council to identify the potential future capacity issues of the sewer network.

10.5.4 Wastewater volumes

The unauthorised diversion of stormwater to the wastewater reticulation increases operating and maintenance costs in pumping and treatment and may result in breaches of the consent conditions relating to the maximum allowable discharge from the treatment plants.

Following a desktop evaluation to identify any correlation between rainfall events and wastewater volumes, areas were identified for further inspection. Staff have commenced a programme of visiting properties and issuing notices to redirect surface water away from the wastewater system.

10.5.5 Sensitivity analysis

Asset Managers have worked with the Finance team and a consultant to develop a spreadsheet model that produces a long term (>50 years) estimates of renewal expenditure cycles, based on consideration of different assumptions regarding useful lives, replacement costs and timing. The model assists in identifying and avoiding significant peaks and troughs in the replacement programme and indicates the level of depreciation funds that will need to be accumulated to allow the work to continue.

10.5.6 Resilience

Resilience is incorporated into the council's outcomes and strategies.

The following is a summary of improvements that have been achieved or are currently being implemented for the Waters activity.

Table 10.2 Summary of improvements' achievements

Improvement plan	Outline and description
Quality of asset information and confidence therein	Further work is planned to develop the "Condition" and "Performance" characteristics in AssetFinda to improve confidence in assessing remaining life. This is particularly useful for underground assets that cannot easily be examined. *Not yet completed*. The assets' location and other physical data are audited randomly to determine the accuracy of the information stored in AssetFinda. *Not yet completed.* Details of new assets are provided by the contractors installing them, as part of their contractual responsibilities. Not yet completed. Details of the individual components in ancillary buildings are scheduled separately in AssetFinda, indicating the description, assessed useful life, installed cost and replacement cost and later reviewed during the revaluation process, which is carried out triennially and independently reviewed.
Maintenance recording	Services staff are working with the vendor to develop the maintenance tracking module in AssetFinda. Up to Version 4 – not yet completed.
Electronic recording of maintenance activities	The budget includes providing hand-held tablets to maintenance staff, which will facilitate recording and transfer of information to the asset management system (AssetFinda). This will be more efficient and effective than the existing paper-based system. – *Not yet completed*
Sensitivity analysis	Asset Managers have been working with the Finance team and a consultant to develop a spreadsheet model that is intended to produce long term (>50 years) estimates of renewal expenditure cycles, based on consideration of different assumptions regarding useful lives, replacement costs and timing. The model will assist in identifying and avoiding significant peaks and troughs in the replacement programme and will indicate the level of depreciation funds that will need to be accumulated to allow the work to continue. Completed but not utilised in AMIS, only finance use this analysis.

10.6 Improvement plan methodology

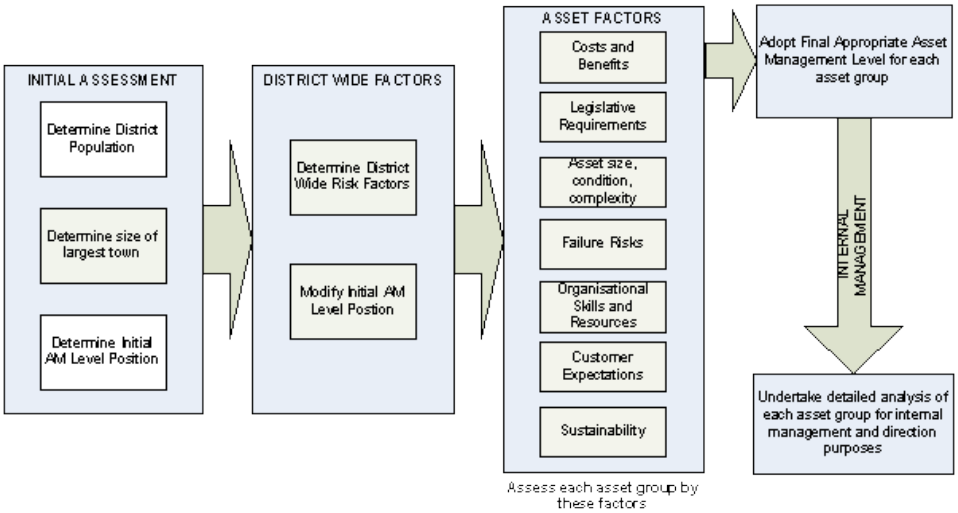


Figure 10.1 Methodology for determining Appropriate Asset Management Level)

Asset management planning, programmes and practice are now embedded into Councils Asset Group Practice. The following diagram outlines the integration between Council structures to support the ongoing implementation of improvement of Council's asset management practices.

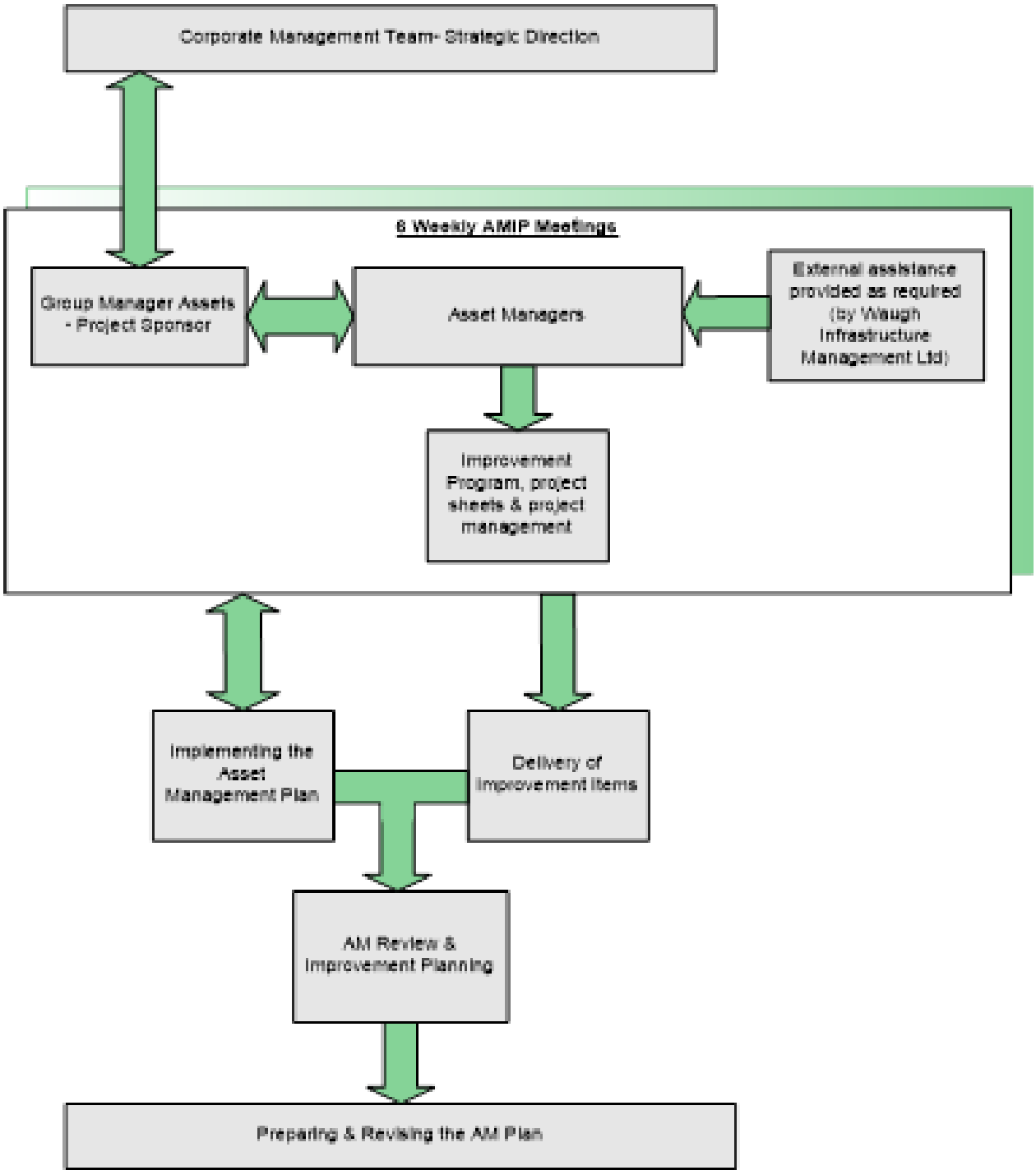


Figure 10.2 Improvement Programme Process

10.7 Monitoring and review procedure

10.7.1 Monitoring approach

South Waikato District Council has developed the AMPs based on an integrated asset management planning approach that includes:

- Customer consultation and subsequent development of service levels
- The configuration of networks to meet customer requirements, now and in the future
- Current asset information
- Well-developed strategies to achieve customer requirements

Further development of Council's asset management approach, including supporting processes, systems and data, will be needed to meet the appropriate level of asset management practice as set out in Council's Asset Management Policy. This Policy will be reviewed periodically to take into account legislative and other national practice changes.

10.7.2 Timetable for audit and review

The programme for future AM reviews of this plan is shown in the table below.

Table 10.3 Timetable for audit and review

Activity	Target Date
Asset Management Improvement Programme 6 weekly meetings with Asset Managers	6 Weekly
Monthly reporting to Group Manager of Assets Monthly Improvement Plan reviewed annually by all staff directly involved and focusing on key business issues	30 June each year
Report on Improvement Plan	30 June each year
AMP updates involving members of staff involved in preparing specific aspect of the AMP	30 June each year
Compliance Status review prior to start of LTP process (to identify and budget for new improvements)	30 August every 3 years
Identify new LOS based on preliminary consultation on LTP	Early in LTP process
Adoption of AMP by Council (linked to adoption of LTP)	30 June every 3 years
External benchmarking by internal staff	Annually
Audit NZ external audit	As required by Audit NZ
External Peer review of AMP	3 Yearly

APPENDIX A ASSET DESCRIPTION & SYSTEM OVERVIEW

A1 The District

The South Waikato District lies at the heart of the North Island of New Zealand. State Highway 1 runs through three of our main towns - Tokoroa, Putāruru, and Tīrau. Forestry and agricultural industries dominate the District, with almost half of the District covered in forest.

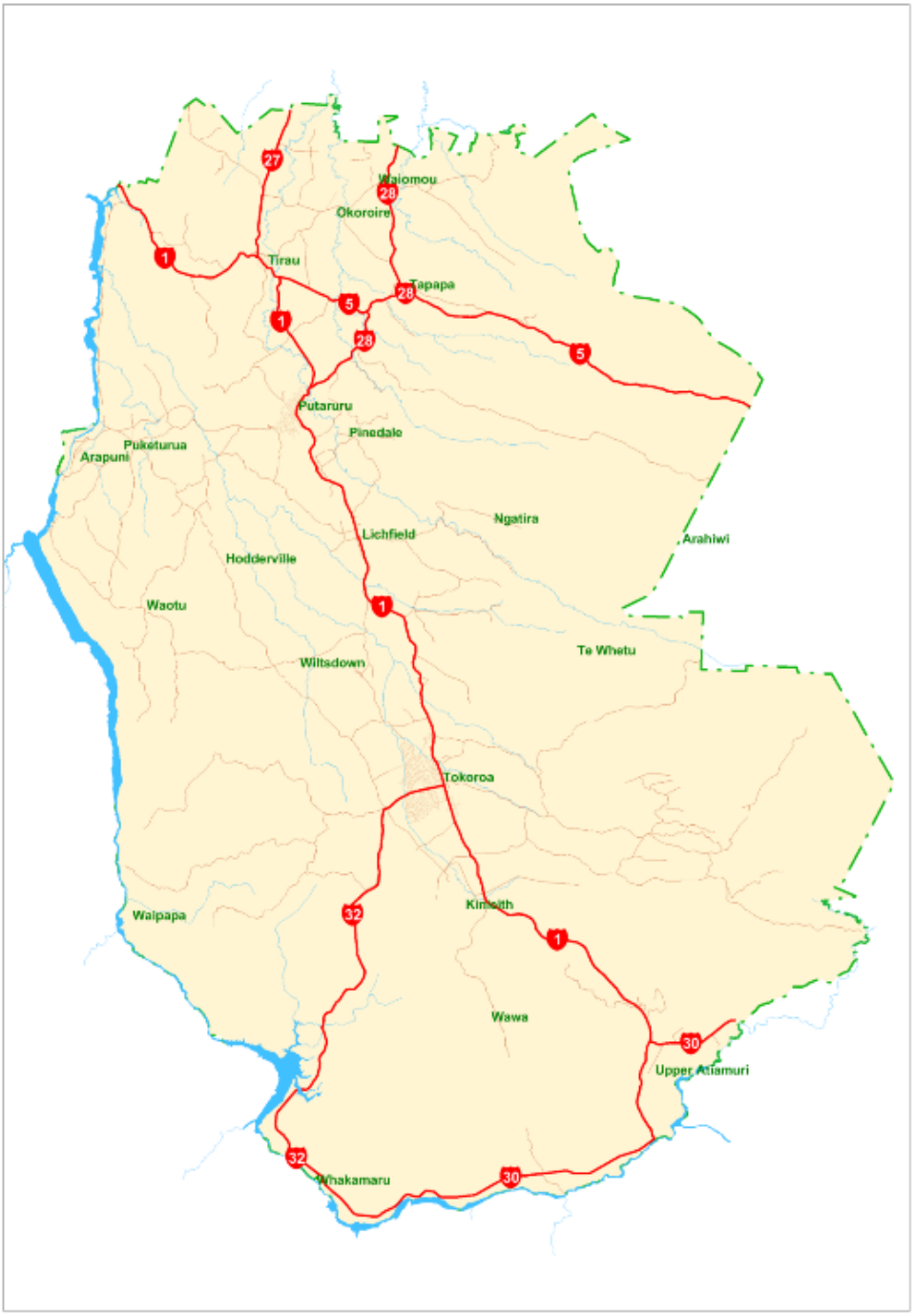


Figure A0.1 South Waikato District Map

A1.1 General Overview

Council's reticulated wastewater collection, treatment and disposal systems serve the four urban areas of Tokoroa, Putāruru, Tīrau, and Arapuni.

These four physically separate systems collectively comprise 167.1 km of reticulation pipelines, 18 pump stations, 3,190 manholes, and 4 treatment plants, which are distributed as follows:

Service Connections

Service connections are generally the property owners' responsibility. Council's responsibility on "public drains" (generally 150 mm and larger sewers) typically ends as follows:

- At the property boundary if the sewer is outside the property
- At the Y junction if the sewer is within the property

Most service connections are either 100 mm glazed earthenware or uPVC, with inspection pipes at the allotment boundary.

A1.2 References

- AssetFinda
- Video camera inspection of Arapuni, Tīrau, Putāruru, and Tokoroa sewers
- Part XXVI Local Government Act 1974 "Sewerage and Stormwater Drainage by Territorial Authorities".

A1.3 Pump Stations

Pump stations have been installed within the reticulation networks for the purpose of pumping sewerage to higher levels to enable it to ultimately gravitate to the treatment plant.

All pump stations are reinforced concrete construction with varying wet well capacities, depending on the size of catchment being served.

Several smaller pump stations have limited storage capacity in the event of a mechanical or electrical failure. Increased storage capacity may need to be considered if there is increased demand from the associated reticulation area.

The pump and motor sets and electrical controls in each station are regularly inspected and are maintained and overhauled, as necessary. An average replacement interval of 20-30 years for pumps and electrical controls has been assumed although it is not unusual for these assets to last much longer than this with regular preventive maintenance.

All pump stations comprise one duty pump and one standby pump except for Sports Grounds, and Satco Drive Pump Station, which have only one pump and Baird Rd, which has three pumps. Normal operating practice rotates the duty and standby pumps to even out the wear. In the case of extended failure, all pump stations have overflow pipes, which generally discharge to prevent damage to electrical controls and any low-lying public or private property.

All pump stations have been fitted with electrical plugs so that they can plug into generators in an emergency. Emergency Management have two 100 KVA generators mounted on trailers

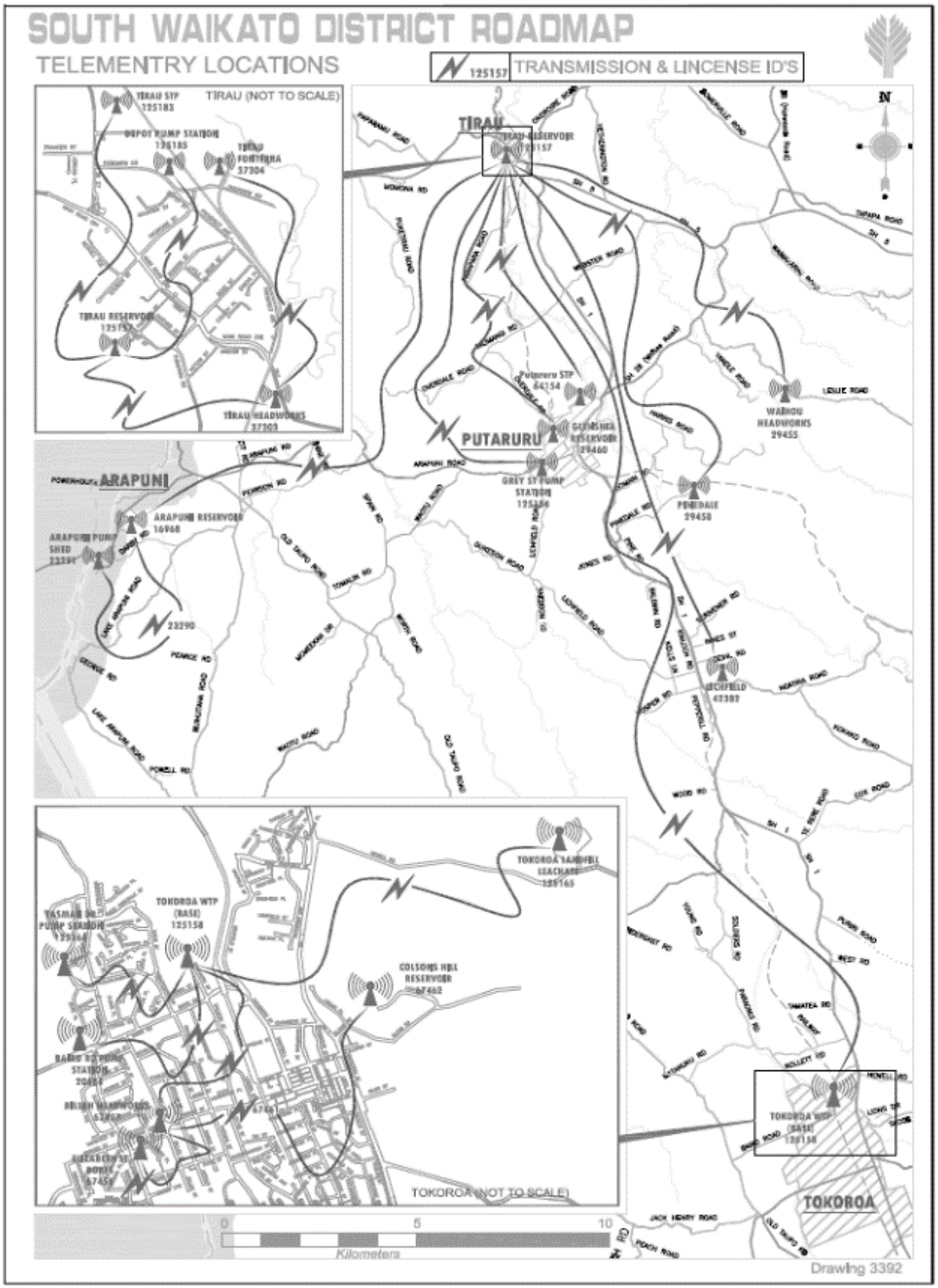


Figure A0.2 Telemetry Map

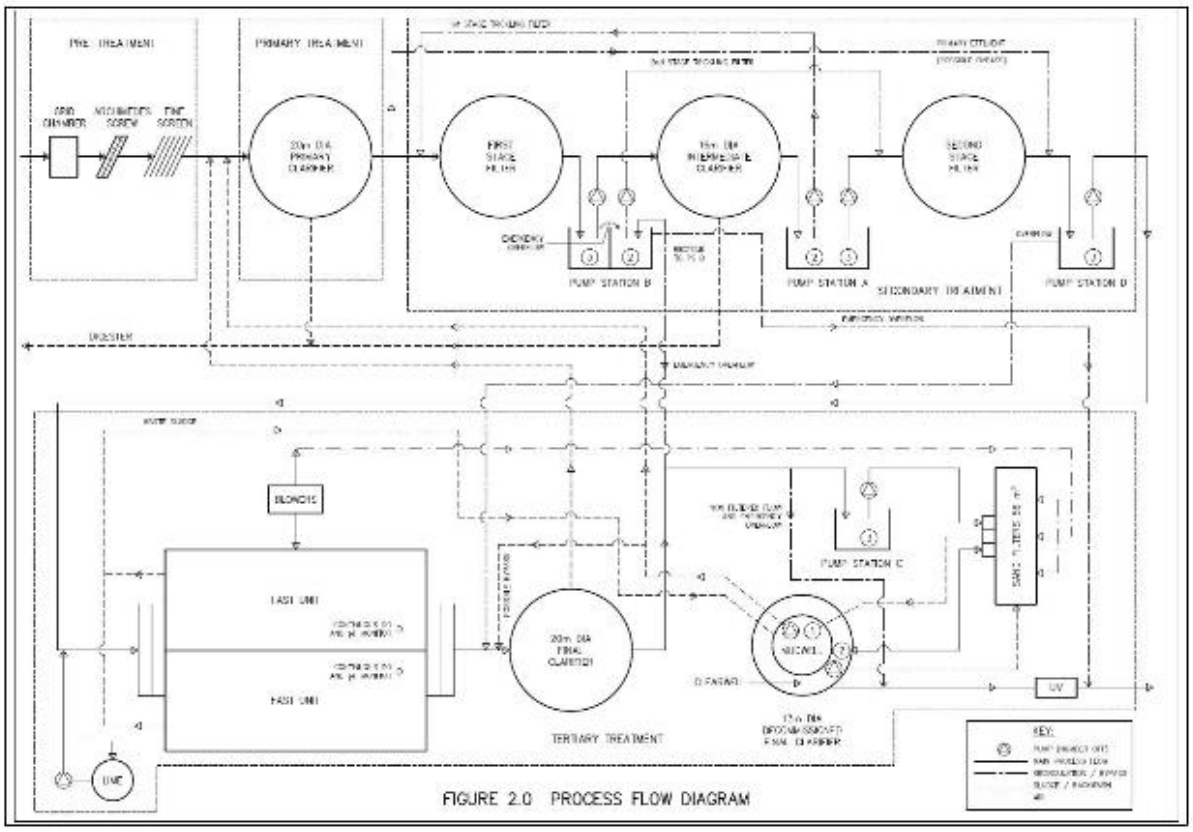


Figure A0.3 Sewage Treatment Plant Schematic

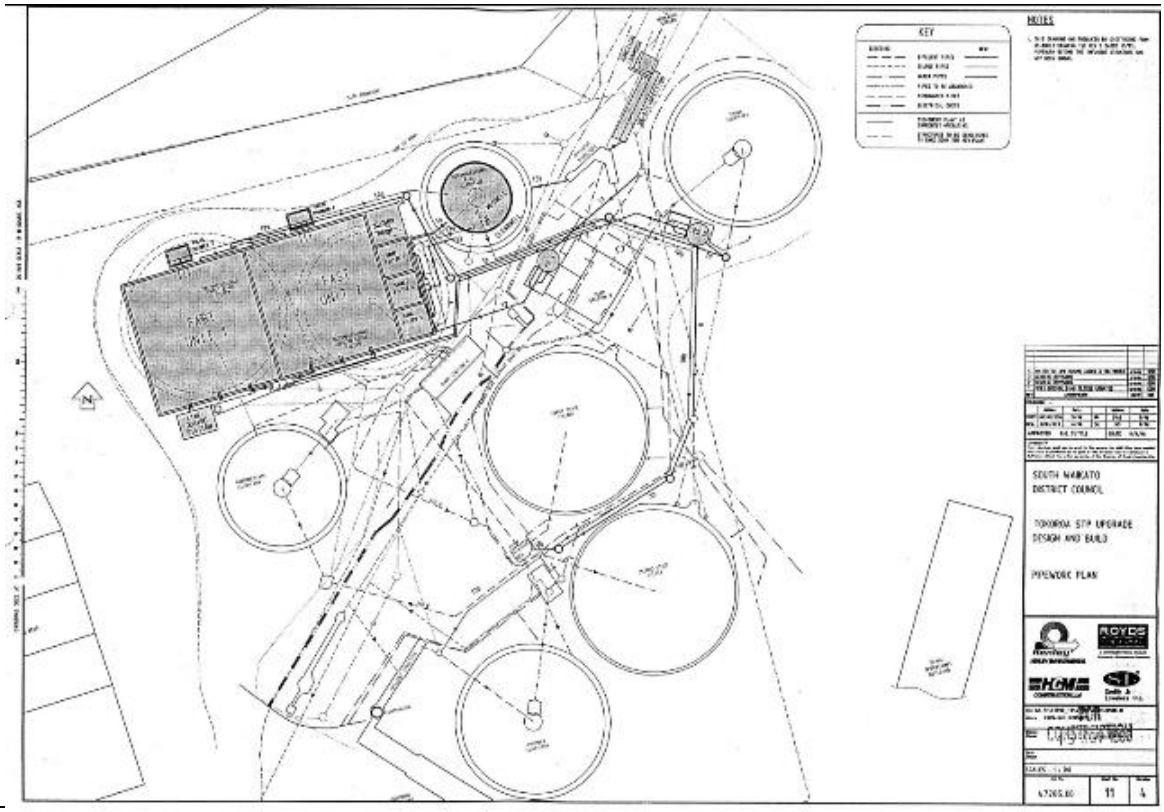


Figure A0.4 Aerial View Drawing

A2 Putāruru – Additional Information

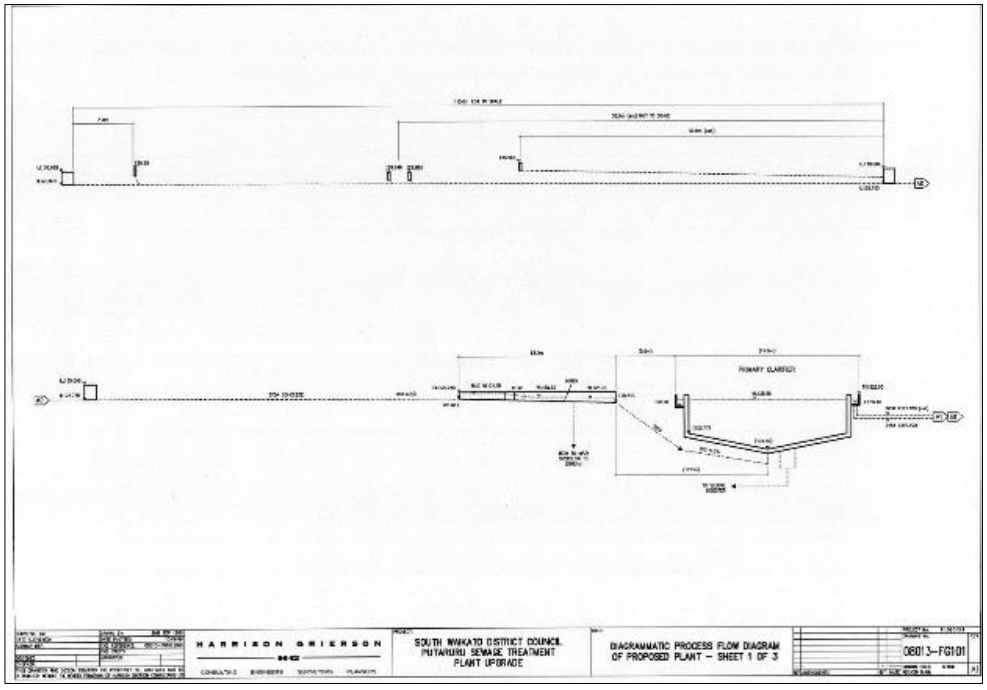


Figure A0.5 Putāruru Sewage Treatment Plant Upgrade - Drawing 1

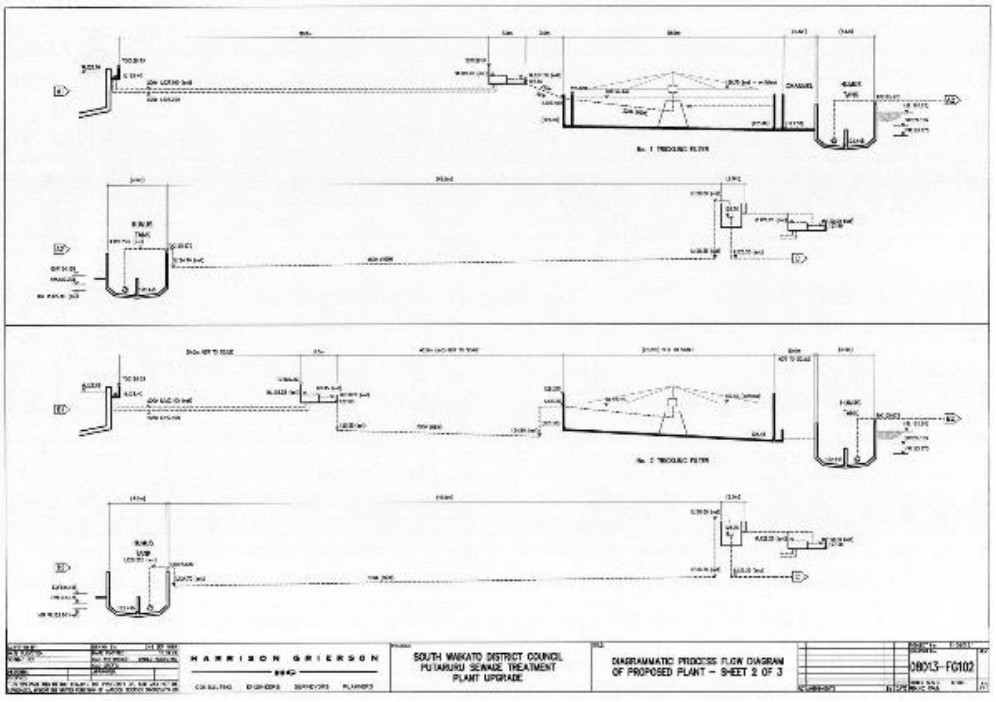


Figure A0.6 Putāruru Sewage Treatment Plant Upgrade - Drawing 2

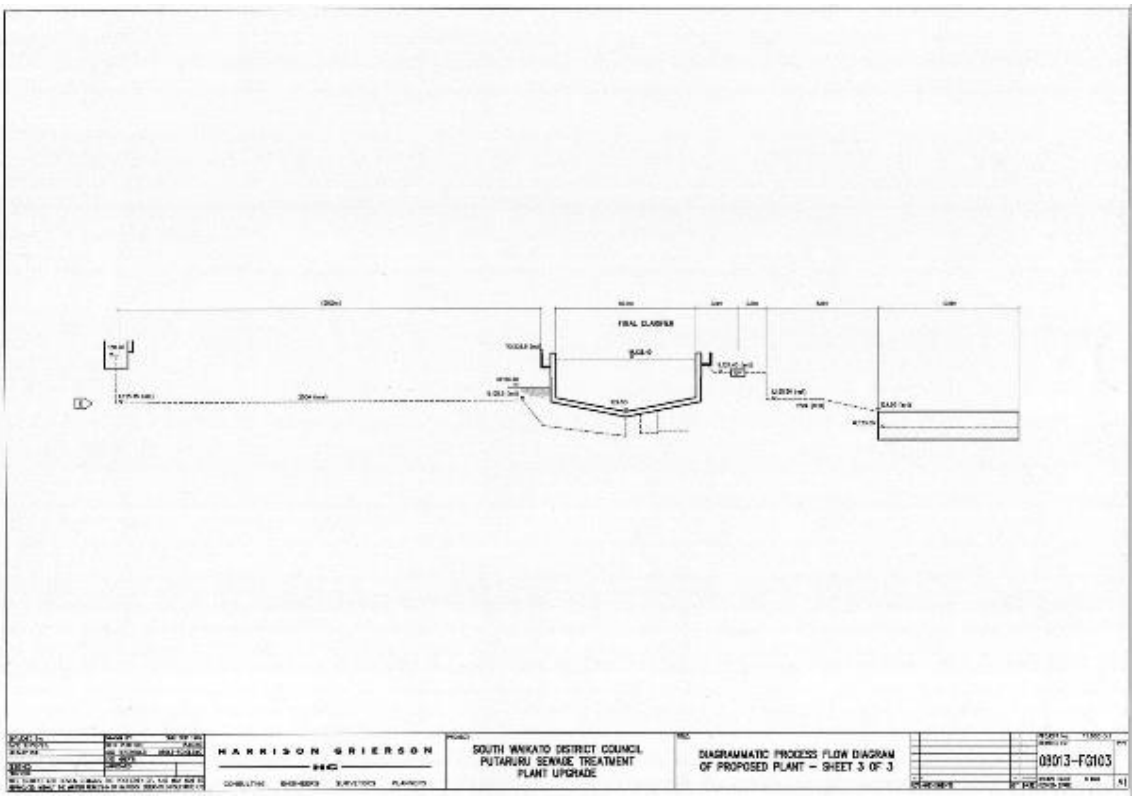


Figure A0.7 Putāruru Sewage Treatment Plant Upgrade - Drawing 3

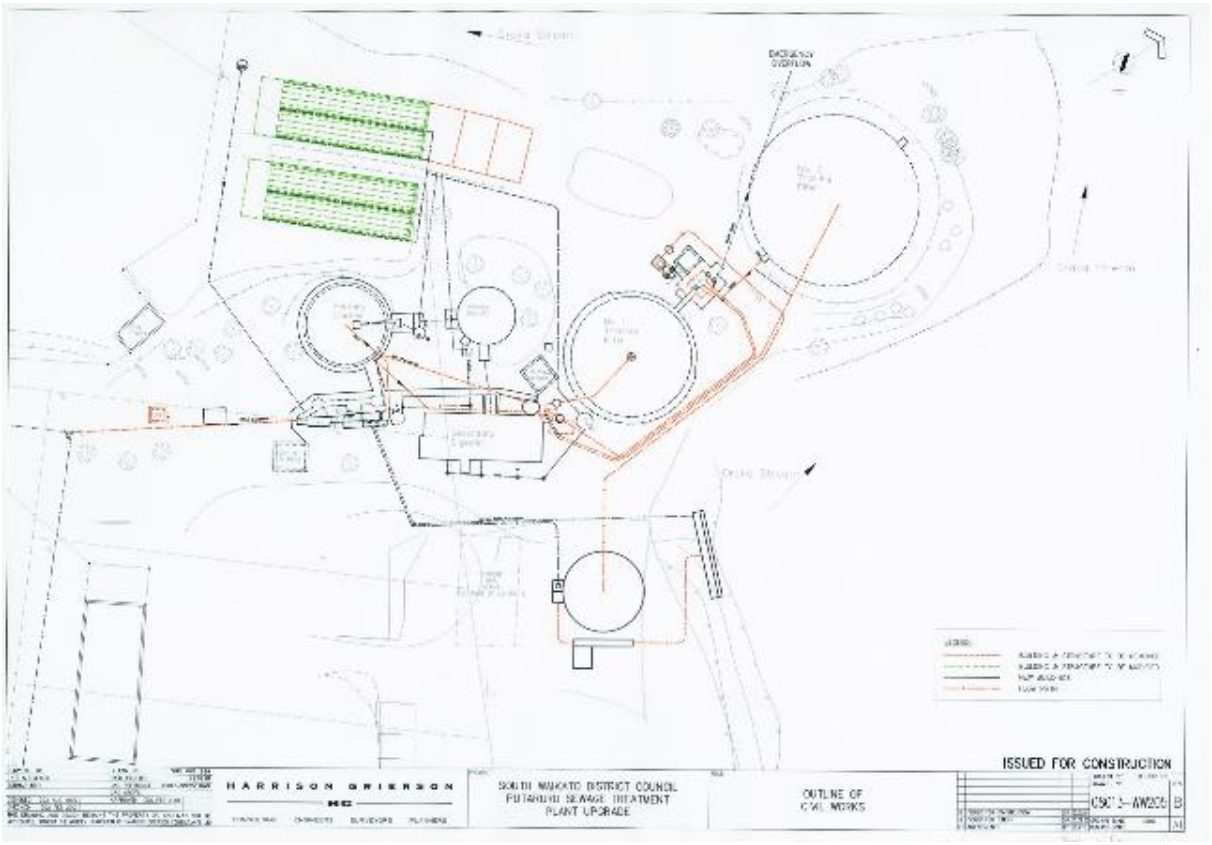


Figure A0.8 Putāruru Sewage Treatment Plant Schematic

A3 Tīrau – Additional Information

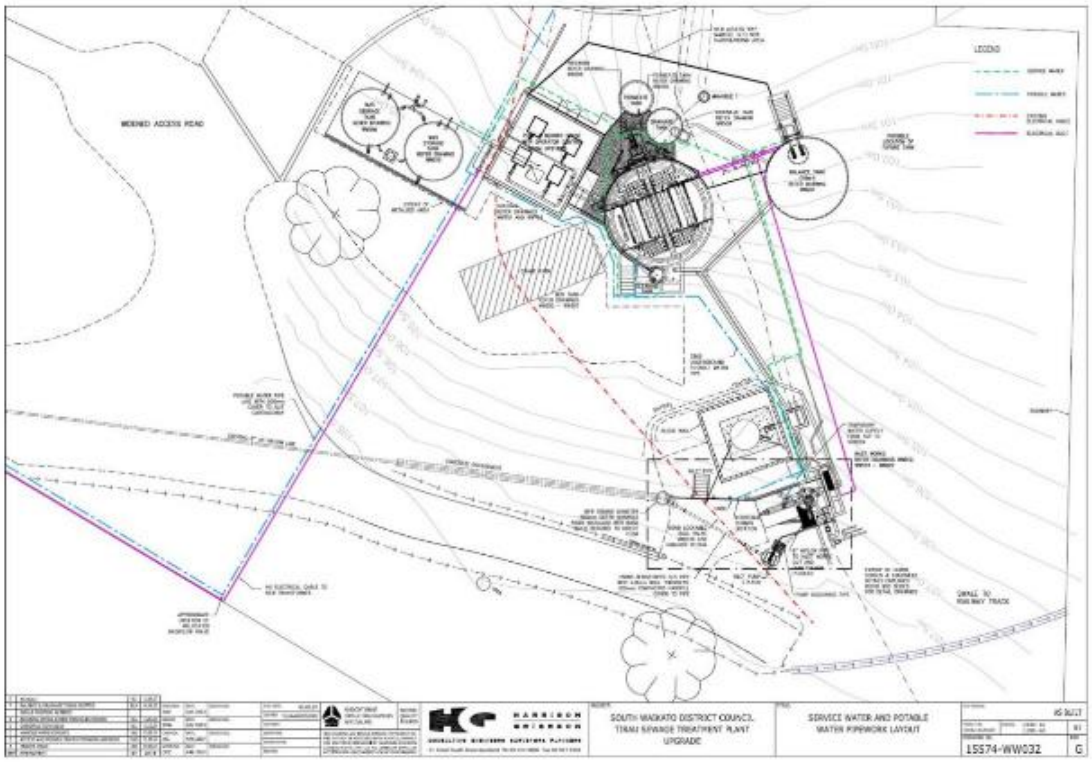


Figure A0.9 Tīrau Sewage Treatment Plant Upgrade

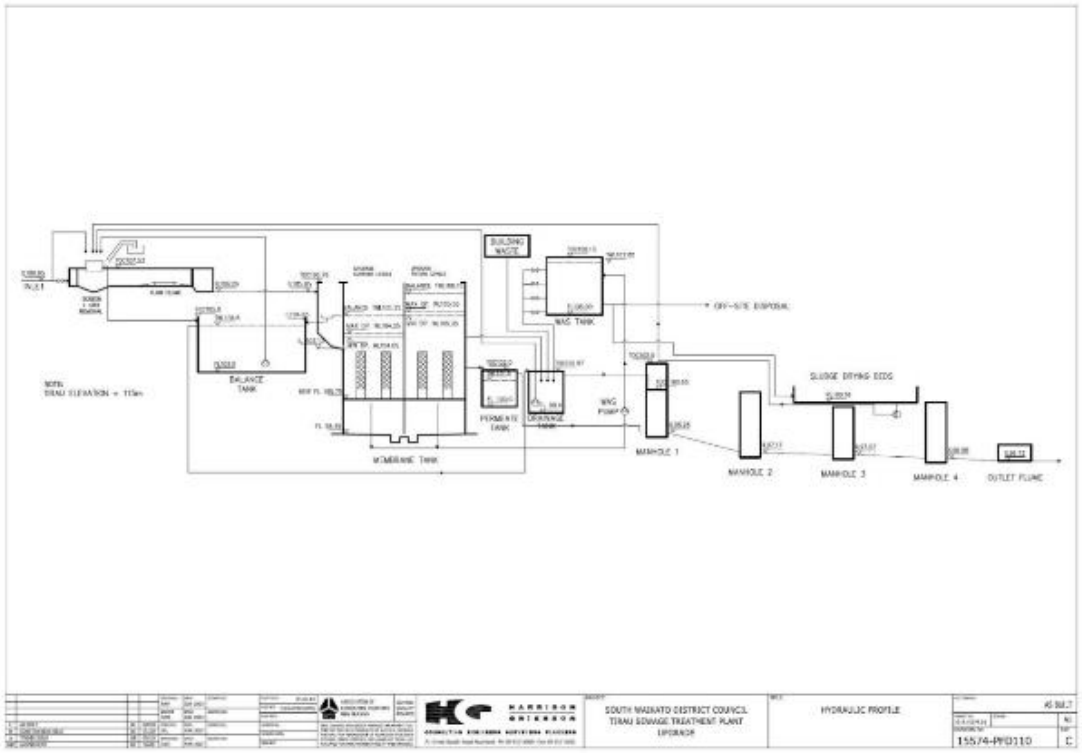


Figure A0.10 Tīrau Sewage Treatment Plant Hydraulic

APPENDIX B DETAILED LEVELS OF SERVICE

B1 Service Level Targets

Table B0.1 Technical Service Levels

Tokoroa Treatment Plant	Maximum Permitted	Actual 2012/13 (90 percentile)
Average daily flow (m^3/day)		
Peak daily flow (m^3/day)	6,000/4,000*	4822
BOD (g/m^3)	12	8.8
Suspended Solids (g/m^3)	12	7.0
Ammoniacal Nitrogen (g/m^3)	5	5
Nitrite – Nitrogen	0.5	0.5
D.R Phosphorous (g/m^3)		
Total Nitrogen (g/m^3)	40	33.0
Faecal Coliforms (MPN/100 ml)	200	21.6
Enterococci (MPN/100 ml)	100	22.4
E-Coli (MPN/100 ml)		
pH	6-9	7.5
Note * During low stream flows		
Putāruru Treatment Plant	Maximum Permitted	Actual 2012/13 (90 percentile)
Average daily flow (m^3/day)		1378
Peak daily flow (m^3/day)	2,500	2654
cBOD5 (g/m^3)	50/30	19.6
Suspended Solids (g/m^3)	50/30	10.9
Ammoniacal Nitrogen (g/m^3)	50/35	11
Nitrite – Nitrogen		
Total Phosphorous (g/m^3)	15/10	6
Total Nitrogen (g/m^3)	55	29.7
Faecal Coliforms (MPN/100 ml)		
Enterococci (MPN/100 ml)		
E-Coli (MPN/100 ml)	5,000/1,000	435
pH		
Tīrau Treatment Plant	Maximum Permitted	Actual 2012/13 (90 percentile)
Average daily flow (m^3/day)		
Peak daily flow (m^3/day)	900	436
cBOD5 (g/m^3)	30/15	3
Suspended Solids (g/m^3)	40/20	4
Ammoniacal Nitrogen (g/m^3)	10/5	0.1
Nitrite – Nitrogen		
Phosphorous (g/m^3)		
Total Nitrogen (g/m^3)		
Faecal Coliforms (MPN/100 ml)	1,000/200	12
Enterococci (MPN/100 ml)		

E-Coli (MPN/100 ml)		
pH	6-8	7.3
Arapuni Treatment Plant	Maximum Permitted	Actual 2012/13 (90 percentile)
Average daily flow (m^3/day)		
Peak daily flow (m^3/day)	120	116
BOD (g/m^3)		
Suspended Solids (g/m^3)		
Ammoniacal Nitrogen (g/m^3)		
Nitrite – Nitrogen		
Phosphorous (g/m^3)		
Total Nitrogen (g/m^3)		
Faecal Coliforms (MPN/100 ml)		
Enterococci (MPN/100 ml)		
E-Coli (MPN/100 ml)		
pH		

APPENDIX C 2011 LTP CONSULTATION - OUTCOMES AND STRATEGIES

Table C0.2 Social Well-being with linked Council Outcomes & Strategies

Vision	Social Well-being	Social Council Outcomes	Social Strategies	Implementing Group of Council
Healthy people thriving in a safe, vibrant, and sustainable community	Social well-being: A safe and healthy society, where people can achieve their goals	Engaged community: We encourage and support an engaged social community through the provision of our services and facilities	Enabling Strategy: 1. Enhance access to and use of Council's services and facilities	All Groups
		Safe and healthy community: We advocate for, and support where we can, improved safety and health for our people	2. Encourage and advocate for a safer community	Economic & Community Development Recreation & Facilities Transport
			3. Encourage and advocate for improved health services for our community	Economic & Community Development Environment

Table C0.3 Economic Well-being with linked Council Outcomes & Strategies

Vision	Economic Well-being	Economic Council Outcomes	Economic Strategies	Implementing Group of Council
Healthy people thriving in a safe, vibrant, and sustainable community	Economic Well-being: A diverse, sustainable economy that aims to provide full employment	Improving image: We focus on improving the image and perception of the South Waikato District	4. Enhance communication with our community and stakeholders	Gov & Corp Economic & Community Development
		Growing economy: We support and encourage existing businesses and endeavour to attract new businesses to the District	5. Stimulate economic development by assisting existing & attracting new business	Economic & Community Development
			Enabling Strategy: 6. Utilise financing arrangements and investments to maximise benefit to our community	Governance & Corporate
		Diverse economy: We encourage the economic base in the District to diversify, especially in relation to tourism	7. Support tourist development	Economic & Community Development
			Enabling Strategy: 8. Manage the Council business - do things well	All Groups
			9. Encourage education and training to improve employment in our district	Economic & Community Development

Table C0.4 Environmental Well-being with linked Council Outcomes & Strategies

Vision	Environmental Well-being	Environmental Council Outcomes	Environmental Strategies	Implementing Group of Council
Healthy people thriving in a safe, vibrant, and sustainable community	Environmental well-being: The District is working towards a recognised pristine and sustainable environment	Sustainable environment We want the South Waikato District to lead the community in sustainable environmental development	10. Encourage a sustainable environment	Environment Transport Governance & Corporate
			11. Sustainability is embedded in all of Council's operations	All Groups
		Well managed environment Council's water and waste systems are sustainable and contribute positively to the District environment	Enabling Strategy 12. Provide sound asset management planning	All Groups with assets

Table C0.5 Cultural Well-being with linked Council Outcomes & Strategies

Vision	Cultural Well-being	Cultural Council Outcomes	Cultural Strategies	Implementing Group of Council
Healthy people thriving in a safe, vibrant, and sustainable community	Cultural well-being: A growing and vibrant community where cultural diversity is celebrated	Celebration of culture: We celebrate the artistic and cultural achievements of our people and the diversity of their cultures	13. Protect and support our community's art and culture and support cultural displays and events	Economic & Community Development
			14. Maintain a strong working relationship with Raukawa	Environment Governance & Corporate
		Well managed environment: Council's water and waste systems are sustainable and contribute positively to the district environment	Enabling Strategy: 15. Develop partnerships that support the achievement of our vision	All Groups

APPENDIX D SUMMARY OF WATER AND SANITARY ASSESSMENTS

D1 Wastewater Assessment

The LGA2002 Section 126 (d) requires an assessment of the health and environmental impacts of discharges of wastewater from current and future demands.

This report was prepared for and adopted by Council in June 2005. All wording below is from the Water and Sanitary Assessment and reflects when it was written.

D1.1 The Communities

Descriptions of the seventeen community wastewater services that were assessed within South Waikato District are detailed in Assessment of Water and Sanitary Services 2006, reviewed 2011 by Waugh Infrastructure Management Ltd below. The full details of the individual communities' wastewater services are shown in the Supplementary Information Section.

Note: Population figures are from the Assessment of Water and Sanitary Services, 2006.

Table D0.6 Description of Communities Wastewater Services)

Community	Population	Service Type	Wastewater		Source/Type of Wastes
			Treatment	Disposal	
Athol	42	Individual property owners	Septic Tanks	Land Disposal	Domestic
Arapuni	300	Council Operated	Imhoff tank and Intermittent sand filter beds	Via infiltration gallery into sandy terrace adjacent to the Waikato River	Predominantly domestic
Lichfield	40	Council Operated	Septic Tanks	Land Disposal	Domestic
Putāruru	3777	Council Operated	Primary and Secondary treatment	Discharge is to the Oraka stream via rock filter/gabion baskets at edge of stream	Domestic 92.5% Industry 7.5%
Tirau	693	Council Operated	Primary and Secondary treatment	Discharge is to the Oraka stream via rock filter/gabion baskets at edge of stream	Predominantly domestic
Tokoroa	12,243	Council Operated	Primary and Secondary treatment	Discharge is to the Whakauru Stream via rock filter/gabion baskets at edge of stream	Predominantly domestic
Kuranui School	80	School	Septic Tanks	Land Disposal	Domestic
Lichfield School	110	School	Septic Tanks	Land Disposal	Domestic
Te Waotu School	120	School	Septic Tanks	Land Disposal	Domestic
Lichfield NZMP	75	Industry	Primary and Secondary treatment (for human waste component)	Land Disposal	Domestic
Kinleith (CHH)	180	Industry	Primary and Secondary treatment (for human waste component)	Via rock filter to Waikato River	Domestic
Ngatira Marae	Up to 30 overnight on monthly basis	Marae	Septic Tanks	Land Disposal	Domestic
Ongaroto Marae	Up to 12 overnight on monthly basis	Marae	Septic Tanks	Land Disposal	Domestic

Community	Population	Service Type	Wastewater		Source/Type of Wastes
			Treatment	Disposal	
Pikitu Marae	Up to 30 overnight on monthly basis but up to 400 once a year	Marae	Septic Tanks	Land Disposal	Domestic
Mangakaretu Marae	Up to 100 overnight on monthly basis but up to 500 once a year	Marae	Septic Tanks	Land Disposal	Domestic
Whakaaratamaiti Marae	Up to 30 overnight on two monthly bases but functions with up to 250 occur	Marae	Septic Tanks	Land Disposal	Domestic
Ruapeka Marae	Up to 30 overnight on fortnightly basis but functions with up to 200 occur	Marae	Septic Tanks	Land Disposal	Domestic
Okoroire Hotel	30	Privately operated	Septic Tanks	Land Disposal	Domestic
Northern and Southern Wastewater Areas	4,194	Individual property owners	Septic Tanks	Land Disposal	Domestic

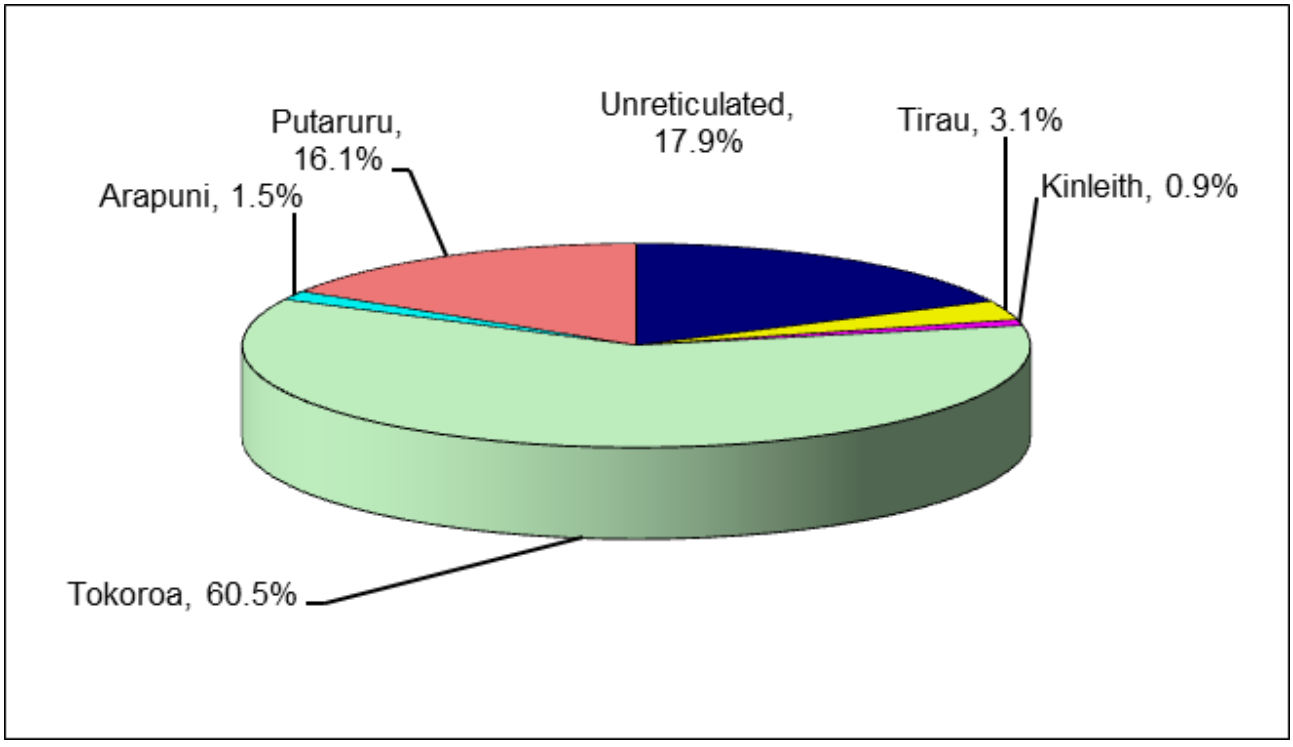


Figure D0.11 Percentage of Populations Served by Community Wastewater Systems

D2 Issues for Community Schemes

D2.1 The Risks for Non-Reticulated Communities

An assessment of the risks to the communities relating to the absence of a reticulated wastewater service was carried out. The levels of risks and mitigation for the non-reticulated communities are detailed in Table D0.7 below. Section 12.1 of the complete Assessment report details the explanation of risk criteria, risk consequence, risk probability and the gross risk scales.

Table D0.7 Risks (Wastewater) for Non-Reticulated Communities

Community	Risk Description	Consequence	Probability	Risk	Mitigation Options
Kuranui School	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Unlikely	L	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
Lichfield School	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Unlikely	L	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
Te Waotu School	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Unlikely	L	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly

Community	Risk Description	Consequence	Probability	Risk	Mitigation Options
Ngatira, Ongaroto, Pikitu, Mangakaretu, and Ruapeka Marae	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Unlikely	L	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
Whakaaratamaiti Marae	Contamination of surface water which has been linked to an increased risk of disease in human	Moderate	Moderate	S	Enforcement of discharge consents by Environment Waikato
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Moderate	M	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
Okoroire Hotel	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Septic tanks are poorly maintained and operated	Minor	Unlikely	L	Community education in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
Northern and Southern wastewater Area	Contamination of surface water which has been linked to an increased risk of disease in human	Moderate	Unlikely	M	Enforcement of discharge consents by Environment Waikato
	Increased levels of nitrogen and phosphate entering water ways	Moderate	Unlikely	M	Ongoing monitoring by Environment Waikato will detect any increase and act accordingly
	Contamination of shallow domestic wells by septic tank discharges	Moderate	Moderate	S	Ensuring effluent disposal systems are located sufficient distances from water takes Testing of well water quality by property owners on a regular basis

Community	Risk Description	Consequence	Probability	Risk	Mitigation Options
	Septic tanks are poorly maintained and operated	Minor	Moderate	M	Community education (to ensure adequate maintenance carried out and septic tank cleaned out on a regular basis) in conjunction with Environment Waikato, neighbouring Councils and Federated Farmers Ensuring septic tank emptying services are available to meet the communities needs
	Pollution of ground water	Minor	Unlikely	L	Monitoring by Environmental Waikato will detect any increase and act accordingly
	Inability to dispose of effluent	Moderate	Rare	M	

D3 The Assessments in Summary

The LGA2002 Section 126(c) and (d) requires an assessment of quality and quantity along with the health and environmental impacts of discharges for each Community.

D3.1 Effluent Quality and Adequacy (Capacity) of Reticulated Wastewater Services

Annual monitoring results from Waikato regional Council indicate that the effluent quality of the four Council operated community wastewater systems is in compliance with the individual wastewater treatment and disposal resource consents. CHH compliance with resource consent discharge conditions have improved so that 100% compliance is now obtained.

D3.2 Effluent Quality and Adequacy (Capacity) of Non-Reticulated Communities

Effluent quality from septic tanks is dependent on a wide range of variables that include - type of septic tank (single or multi chambered), size, if filter is fitted, disinfection of effluent, type of effluent disposal (ground disposal using dosing system), quality of installation, loadings (number of people in household), extent of maintenance carried out and the extent that the septic tank is abused (extensive loadings, flushing chemical etc.).

Discussions with both South Waikato District Council and Waikato Regional Council Staff have clearly indicated that problems with treatment/disposal via septic tanks and associated land drainage systems are minor within the District. This is due to South Waikato's free draining pumice soils.

D3.3 Health and Environmental Impacts of discharges for Current and Estimated Future Demands - Non-Reticulated Communities

The South Waikato District's Asset Management Plans for wastewater will demonstrate that the facilities and reticulation will meet current and future demands. Reporting required in the 2015 LTP will clearly demonstrate the ability of the infrastructure to cope with existing and future demands.

In communities where there is no reticulated scheme, it has been shown that South Waikato's free draining soils allow individual septic tanks to provide environmentally sound effluent disposal.

D4 The Options and their Suitability

D4.1 Community Schemes

Options to meet the current and future demands for Council Wastewater Services will be detailed in the 2015 Asset Management Plans.

D4.2 Non-Reticulated Areas

In communities where there is no reticulated scheme, it has been shown that South Waikato's free draining soils allow individual septic tanks to provide environmentally sound effluent disposal.

D4.3 Proposals for New or Replacement Infrastructure

Addition information on renewals and proposed new infrastructure will be detailed in the 2015 Asset Management plans

APPENDIX E RISK ASSESSMENT – SUPPORTING INFORMATION

Table E0.8 Risk Assessment

	No	Risk Description	Impact	Probability	Risk	Response
Common Issues						
	1	Cyclonic episode	4	D	S	Review exposure
	2	Volcanic disruption	3	E	M	Accept
	3	Earthquake	5	D	H	Apply correct design loadings to new structures and have an emergency back-up plan
	4	Material breakages	3	B	S	Apply asset management plan
	5	Reduced consumer base	2	B	S	Monitor
	6	Loss of income	3	C	S	Monitor
	7	Criminal misuse	4	E	S	Accept
	8	Affordability	2	D	L	Accept
	9	Technology change	2	B	S	Monitor
	10	Limited contractor resources	3	C	S	Monitor
	11	Plan changes	2	A	S	Monitor
	12	Iwi issues	4	A	H	Monitor
	13	Vandalism	3	D	M	Monitor
	14	Delayed maintenance	3	C	S	Apply asset management plan
	15	Inadequate design	3	D	M	Select qualified and experienced designers
	16	Commercial risk	3	C	S	Apply asset management plan
	17	Business continuity	3	C	S	Apply asset management plan
	18	Occupational risk	2	D	L	Comply with legislative requirements
	19	Operator strike action	3	D	M	Accept
	20	Sabotage	5	E	H	Undertake security review
	21	Consumer expectations quality	3	D	M	Customer satisfaction surveys
	22	Asset condition knowledge	2	C	S	Apply asset management plan
Reticulation						
	23	Power failure	3	C	S	Backup plan in event of failure
	24	Pump failure	3	C	S	Backup plan in event of failure
	25	Telemetry control system failure	2	D	L	Backup plan in event of failure
	26	Landowner issues	2	C	M	Accept
	27	Pipe failures	3	B	S	Apply asset management plan
	28	Excavation breakages	3	C	S	Monitor
	29	Stormwater infiltration	2	A	S	Monitor in relation to consent compliance and treatment plant and pump station performance
	30	Wastewater exfiltration	2	C	M	Accept
	31	Water supply failure	4	D	S	Accept
	32	Reticulation security	4	D	S	Monitor
	33	Asset location knowledge	2	C	M	Apply asset management plan
	34	Easements	3	B	S	Accept

APPENDIX F DEMAND INFORMATION

Council has developed a comprehensive model identifying the drivers of demand for services.

F1 Demand Drivers

The drivers of demand for the Wastewater Activity are as follows:

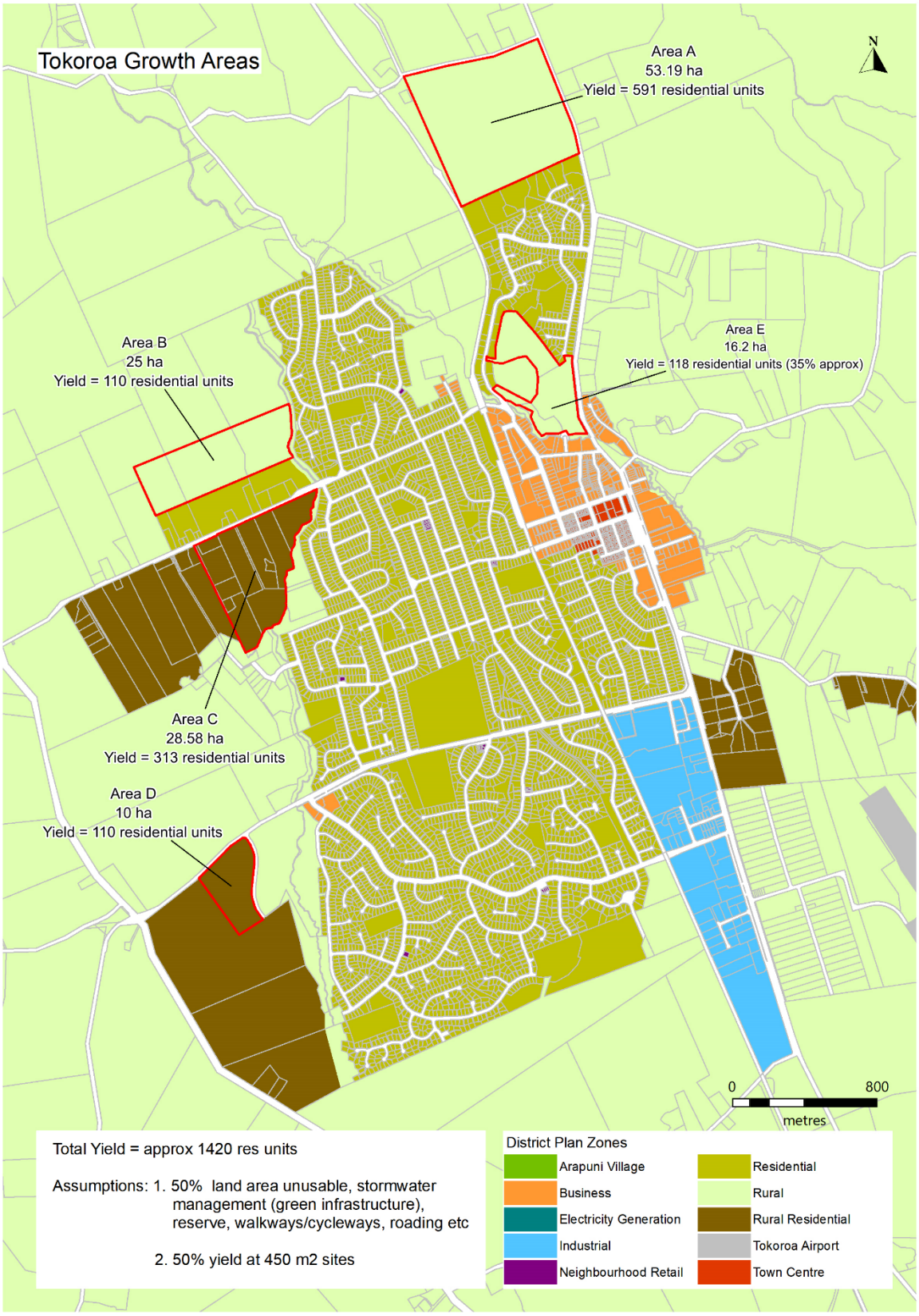
Table F0.9 Demand Matrix

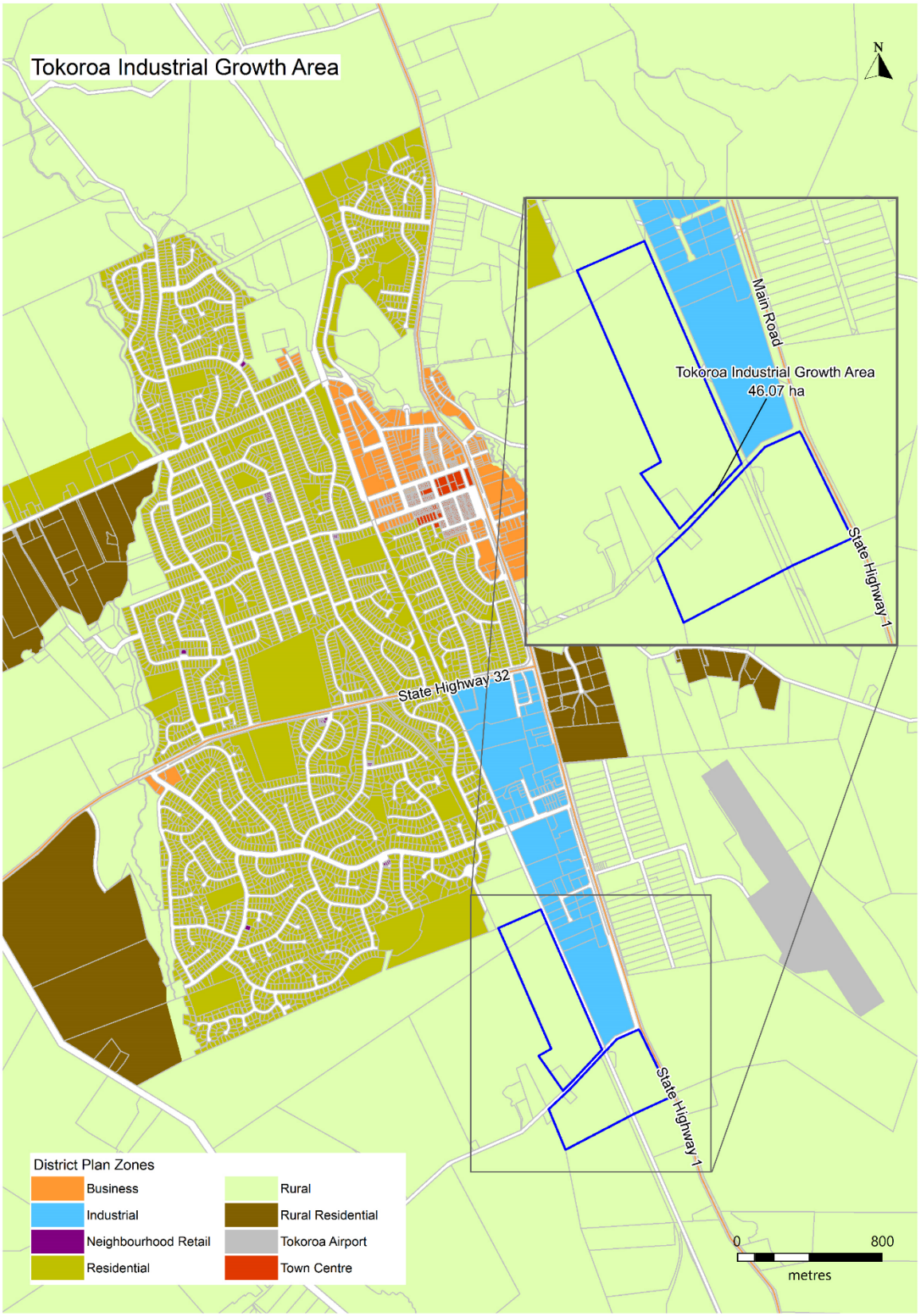
	Sector Creating the Demand			Basis of the Driver			
	Domestic	Commercial	Community	Industrial	Resident Population Growth	Per-head Demand Growth	Unrelated to Resident Population
Growth in resident population	✓	✓	✓	✓	✓		
Shifting patterns of farming, forestry & industry				✓			✓
Housing trends that include multiple bathrooms and toilets	✓					✓	
Increasing use of in-sink garbage disposals	✓					✓	
Demand for trade waste disposal		✓		✓			✓

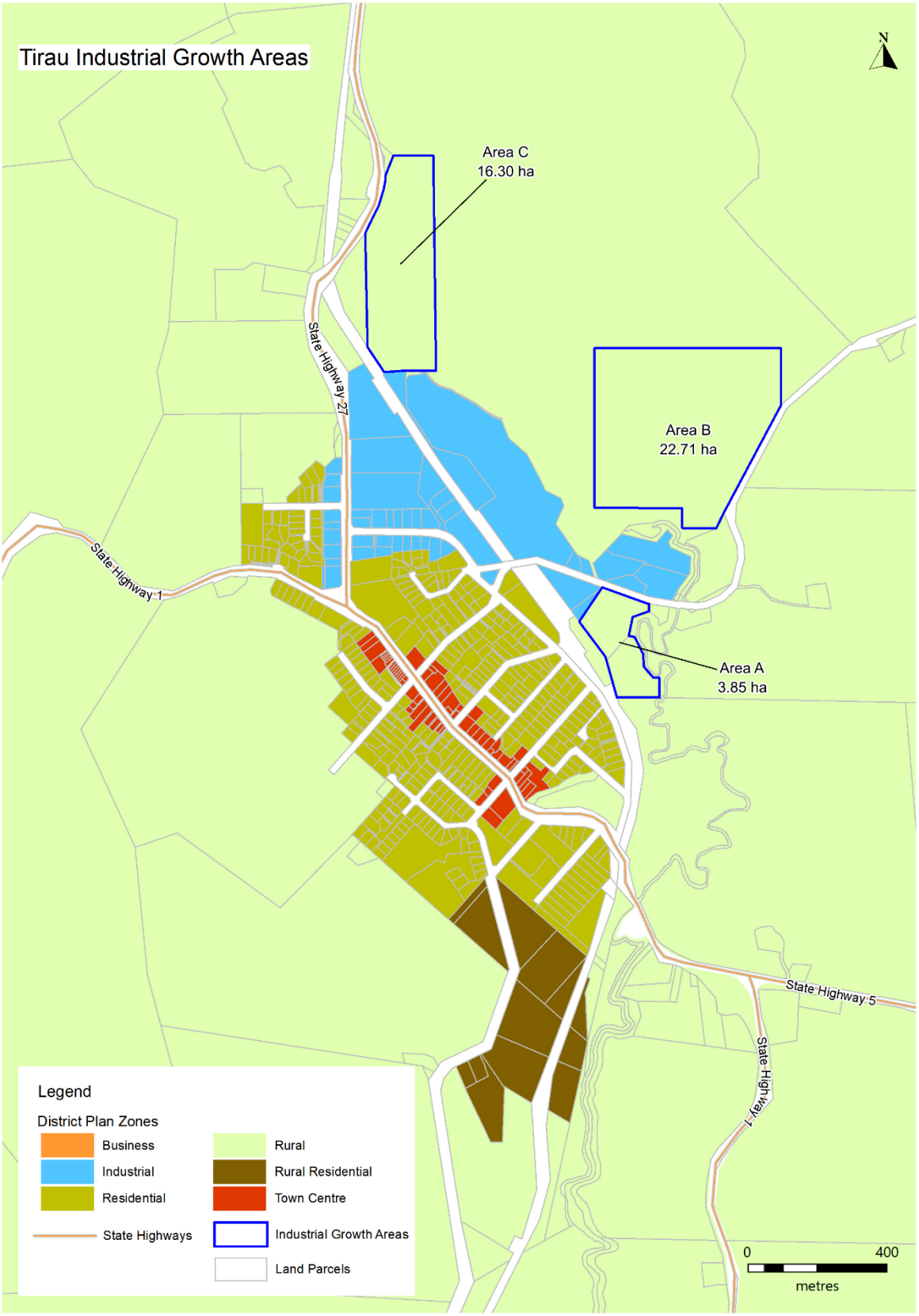
These individual drivers influence overall demand as indicated in the model below. Key numerical parameters in this model are:

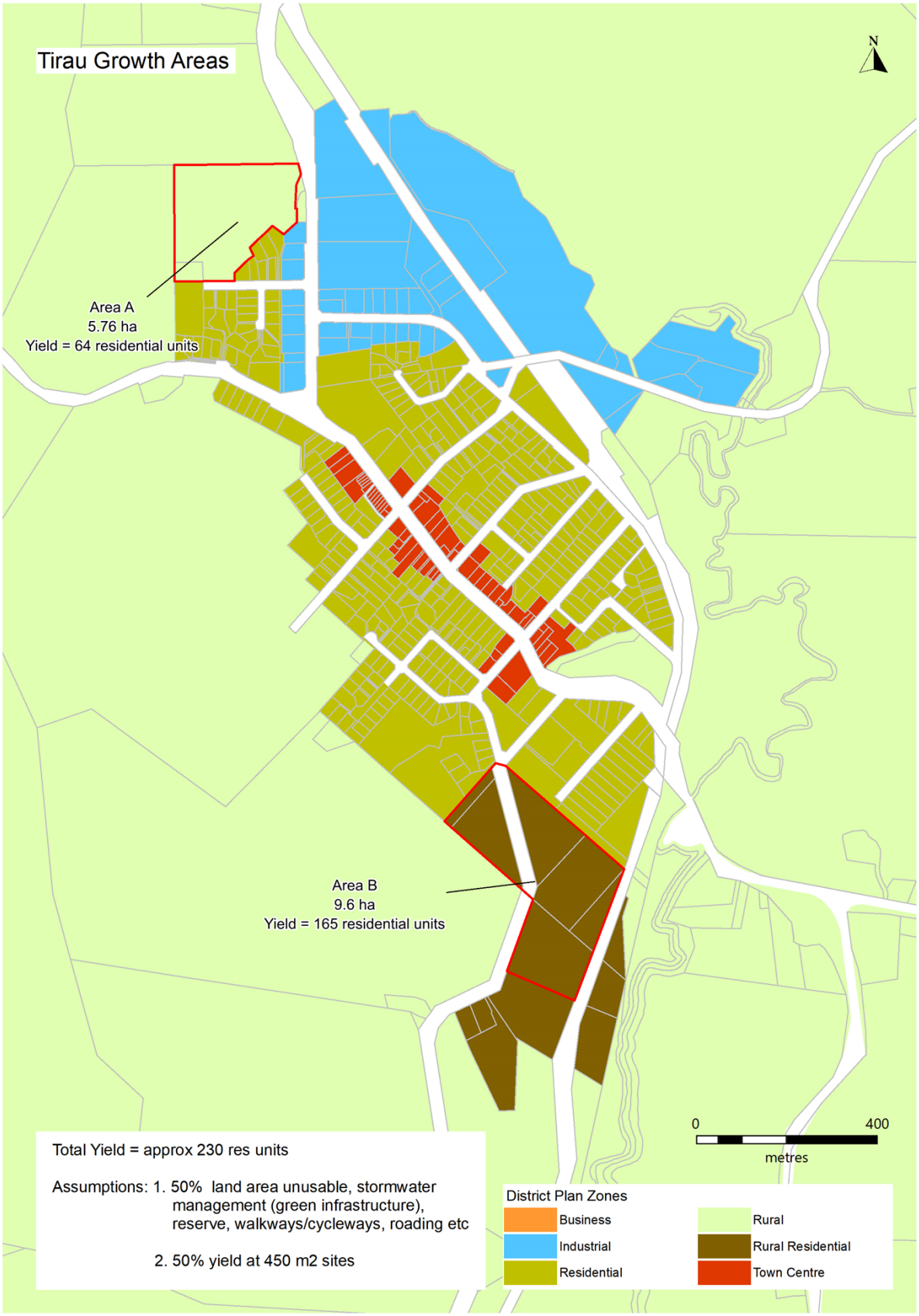
- Resident population trends of reticulated areas – stable at about the levels identified in Section 4.2.3
- Per-head demand – this is increasing as implied from increasing water use
- Non-resident population – this has been implicitly accounted for in that the network also serves public toilets and toilets and washrooms in commercial and public buildings
- Changes in economic activity – forest land converted to dairy farms has brought between 30 and 50 new families into the District. These families are certain to be based outside of the reticulated areas, which has not increased the demand.

F2 New Growth Areas









APPENDIX G OPEX AND CAPEX CAPITAL IMPROVEMENT & RENEWAL LTP 2021 PROGRAMMES

G1 OPEX LTP PROGRAMMES – July 2021

Summary – July 2021

OPEX LTP 2021	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Wastewater	**6,281,422**	**7,111,905**	**7,522,061**	**8,005,880**	**8,367,405**	**8,778,893**	**9,223,680**	**9,402,378**	**9,621,643**	**10,223,058**
50000- Wastewater - District	893,399	982,882	1,071,406	1,129,522	1,074,048	1,117,241	1,112,909	1,135,430	1,178,049	1,180,565
50100- Wastewater - Tokoroa	3,075,937	3,697,967	3,944,583	4,179,790	4,260,431	4,358,958	4,646,308	4,741,049	4,836,644	5,206,894
50200- Wastewater - Putaruru	687,122	738,137	755,526	876,798	1,170,146	1,395,134	1,482,879	1,500,998	1,535,078	1,664,651
50201- Wastewater - Putaruru - DCs	15,022	31,456	31,456	31,456	31,456	31,456	31,456	31,456	34,684	37,911
50300- Wastewater - Tirau	399,292	420,788	450,869	492,527	506,794	522,365	565,764	579,141	592,944	652,201
50400- Wastewater - Arapuni	90,651	92,675	94,460	97,388	99,250	101,579	106,445	108,385	110,325	116,676
92000- Wastewater Services	1,120,000	1,148,000	1,173,760	1,198,400	1,225,280	1,252,160	1,277,920	1,305,920	1,333,920	1,364,160

Detailed – July 2021

OPEX LTP 2021	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Wastewater	**6,281,422**	**7,111,905**	**7,522,061**	**8,005,880**	**8,367,405**	**8,778,893**	**9,223,680**	**9,402,378**	**9,621,643**	**10,223,058**
50000- Wastewater - District	893,399	982,882	1,071,406	1,129,522	1,074,048	1,117,241	1,112,909	1,135,430	1,178,049	1,180,565
5000000260129. OH - Tokoroa Depot	9,145	9,907	10,466	10,753	10,883	11,204	11,358	11,530	12,017	12,196
5000000265000. OH - Corporate Management	55,732	57,634	59,101	60,573	61,486	62,551	63,732	64,961	66,127	67,489
5000000266000. OH - Corporate Services	45,817	48,800	50,432	52,332	52,491	53,428	54,322	55,575	56,405	57,540
5000000270100. OH - Customer Services Tokoroa	3,150	3,272	3,411	3,498	3,466	3,524	3,580	3,659	3,720	3,795
5000000270200. OH - Customer Services Putaruru	1,714	1,759	1,799	1,847	1,867	1,905	1,937	1,976	1,882	1,966
5000000275000. OH - Finance Services	121,014	125,930	129,750	133,809	134,998	137,439	139,823	142,433	144,844	147,771
5000000275013. OH - Rates	101,467	105,298	109,346	114,453	112,939	115,429	118,904	119,289	121,169	125,521
5000000281000. OH - Strategic Policy	34,082	40,584	47,566	38,804	38,842	50,386	40,126	41,004	53,234	42,457
5000000284000. OH - Asset Management	149,357	154,731	159,154	164,008	165,711	168,877	171,923	175,403	178,429	182,075
5000000284001. OH - Assets Business Support	127,436	118,216	135,671	156,298	118,277	132,141	123,779	123,936	138,612	130,904
5000000285000. OH - Asset Management Services	127,964	134,835	139,638	144,946	145,323	147,847	150,268	153,436	156,013	159,148
5000000289000. OH - Programme Management	87,277	98,816	106,626	112,756	110,600	111,931	113,218	115,528	116,887	118,867
5000000292000. OH - Wastewater Services	(165,442)	(139,429)	(128,457)	(111,910)	(136,672)	(144,875)	(152,125)	(152,626)	(159,869)	(165,903)
5000000296000. OH - Infrastructure & Maintenance	158,455	163,637	175,061	177,570	177,101	183,663	182,430	186,263	191,973	191,883
50000010. Depreciation	21,097	43,094	44,937	51,574	55,501	58,694	65,882	68,616	71,461	78,976
50000108. Asset Management Plan	15,000	15,375	26,200	16,050	16,410	16,770	17,115	17,490	17,865	18,270
50000423. Health & Safety	0	0	0	0	0	0	0	0	0	0
50000457. Interest	135	422	704	2,162	4,825	6,327	6,638	6,956	7,280	7,611
50100- Wastewater - Tokoroa	3,075,937	3,697,967	3,944,583	4,179,790	4,260,431	4,358,958	4,646,308	4,741,049	4,836,644	5,206,894
50100010. Depreciation	895,375	1,071,160	1,116,504	1,274,096	1,297,944	1,340,066	1,573,013	1,609,008	1,645,714	1,955,432
50100010004. Depreciation	0	0	0	0	0	0	0	0	0	0
50100108. Asset Management Plan	0	0	0	0	0	0	0	0	0	0
50100109. Laboratory	150,146	153,900	157,353	160,656	164,260	167,863	171,317	175,070	178,824	182,878
50100109650. Laboratory Internal Water Services	20,000	20,500	20,960	21,400	21,880	22,360	22,820	23,320	23,820	24,360
50100110. Operations - Treatment Plant	730,000	975,000	1,003,800	1,017,000	1,031,900	1,046,300	1,060,100	1,075,100	1,090,100	1,106,300
50100110650. Operations Trmt Plt Internal WM	600,000	666,250	681,200	695,500	711,100	726,700	741,650	757,900	774,150	791,700
50100111. Resource consents	6,000	6,150	6,288	6,420	6,564	6,708	6,846	6,996	7,146	7,308
50100300. Chemicals	45,000	56,375	183,400	187,250	191,450	195,650	199,675	204,050	208,425	213,150
50100303. Repairs & Mtce - Reticulation	60,000	61,500	62,880	64,200	65,640	67,080	68,460	69,960	71,460	73,080
50100303001. Repairs & Mtce-Raising Manhole	0	0	0	0	0	0	0	0	0	0
50100303650. R & M Reticulation Internal WM	90,000	92,250	94,320	96,300	98,460	100,620	102,690	104,940	107,190	109,620
50100309. Cctv Inpections	30,000	41,000	52,400	80,250	82,050	83,850	85,575	87,450	89,325	91,350
50100352. Power	230,000	235,750	241,040	246,100	251,620	257,140	262,430	268,180	273,930	280,140
50100453. Remissions	19,000	19,475	19,912	20,330	20,786	21,242	21,679	22,154	22,629	23,142
50100457. Interest On Loan	108,265	204,203	207,952	211,687	215,964	220,353	224,909	229,473	234,179	236,194
50100458. Insurance	41,853	42,899	43,862	44,783	45,787	46,792	47,754	48,801	49,847	50,977
50100463. Rates - WRC	4,063	4,165	4,258	4,347	4,445	4,542	4,636	4,737	4,839	4,949
50100463625. Council Rates - SWDC	36,235	37,141	37,974	38,771	39,641	40,511	41,344	42,250	43,156	44,134
50100464. Lapp	0	0	0	0	0	0	0	0	0	0
50100466. Write Offs - Rates	0	0	0	0	0	0	0	0	0	0
50100466001. Write Offs - Other	0	0	0	0	0	0	0	0	0	0
50100531. Consultants	10,000	10,250	10,480	10,700	10,940	11,180	11,410	11,660	11,910	12,180
50100531002. Tokoroa Wastewater Feasibility Study	0	0	0	0	0	0	0	0	0	0

OPEX LTP 2021	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
50200- Wastewater - Putaruru	687,122	738,137	755,526	876,798	1,170,146	1,395,134	1,482,879	1,500,998	1,535,078	1,664,651
50200010. Depreciation	259,853	300,686	306,092	384,226	478,039	535,053	613,431	621,368	645,267	763,843
50200010004. Depreciation	0	0	0	0	0	0	0	0	0	0
50200109. Laboratory	30,000	30,750	31,440	32,100	32,820	33,540	34,230	34,980	35,730	36,540
50200109650. Laboratory Internal Water Services	3,000	3,075	3,144	3,210	3,282	3,354	3,423	3,498	3,573	3,654
50200110. Operations	75,000	76,375	77,640	78,850	205,170	331,490	332,755	334,130	335,505	336,990
50200110650. Operations Internal WM	100,000	102,500	104,800	107,000	109,400	111,800	114,100	116,600	119,100	121,800
50200111. Resource consents	4,000	4,100	4,192	4,280	4,376	4,472	4,564	4,664	4,764	4,872
50200300. Chemicals	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
50200303. Repairs & Mtce - Reticulation	75,000	76,875	78,600	80,250	82,050	83,850	85,575	87,450	89,325	91,350
50200303650. R & M Reticulation Internal WM	30,000	30,750	31,440	32,100	32,820	33,540	34,230	34,980	35,730	36,540
50200352. Power	50,000	51,250	52,400	53,500	54,700	55,900	57,050	58,300	59,550	60,900
50200452. Doubtful Debts	0	0	0	0	0	0	0	0	0	0
50200453. Remissions	28,000	28,700	29,344	29,960	30,632	31,304	31,948	32,648	33,348	34,104
50200457. Interest On Loan	0	0	2,616	36,794	101,555	134,754	134,754	134,754	134,754	134,754
50200458. Insurance	14,702	15,070	15,408	15,731	16,084	16,437	16,775	17,143	17,510	17,907
50200463. Rates - WRC	2,417	2,477	2,533	2,586	2,644	2,702	2,758	2,818	2,879	2,944
50200463625. Council Rates - SWDC	10,150	10,404	10,637	10,861	11,104	11,348	11,581	11,835	12,089	12,363
50200464. Lapp	0	0	0	0	0	0	0	0	0	0
50201- Wastewater - Putaruru - DCs	15,022	31,456	31,456	31,456	31,456	31,456	31,456	31,456	34,684	37,911
50201457. Interest Payable	15,022	31,456	31,456	31,456	31,456	31,456	31,456	31,456	34,684	37,911
50300- Wastewater - Tirau	399,292	420,788	450,869	492,527	506,794	522,365	565,764	579,141	592,944	652,201
50300010. Depreciation	129,782	145,004	158,551	186,909	196,172	206,143	243,503	250,317	257,556	309,724
50300010004. Depreciation	0	0	0	0	0	0	0	0	0	0
50300109. Laboratory	16,000	16,400	16,768	17,120	17,504	17,888	18,256	18,656	19,056	19,488
50300109650. Laboratory Internal Water Services	2,000	2,050	2,096	2,140	2,188	2,236	2,282	2,332	2,382	2,436
50300110. Operations	50,000	51,250	54,400	55,500	56,700	57,900	59,050	60,300	61,550	62,900
50300110650. Operations Internal WM	75,000	76,875	78,600	80,250	82,050	83,850	85,575	87,450	89,325	91,350
50300111. Resource consents	6,000	6,150	6,288	6,420	6,564	6,708	6,846	6,996	7,146	7,308
50300300. Chemicals	30,000	30,750	31,440	32,100	32,820	33,540	34,230	34,980	35,730	36,540
50300303. Repairs & Mtce - Reticulation	15,000	15,375	15,720	16,050	16,410	16,770	17,115	17,490	17,865	18,270
50300303650. R & M Reticulation Internal WM	10,000	10,250	10,480	10,700	10,940	11,180	11,410	11,660	11,910	12,180
50300352. Power	45,000	46,125	47,160	48,150	49,230	50,310	51,345	52,470	53,595	54,810
50300453. Remissions	2,100	2,153	2,201	2,247	2,297	2,348	2,396	2,449	2,501	2,558
50300457. Interest On Loan	6,261	5,954	14,434	21,941	20,627	19,910	19,894	19,875	19,858	19,840
50300458. Insurance	8,658	8,874	9,074	9,264	9,472	9,680	9,879	10,095	10,312	10,545
50300463. Rates - WRC	394	404	413	422	431	440	450	459	469	480
50300463625. Council Rates - SWDC	3,097	3,174	3,246	3,314	3,388	3,462	3,534	3,611	3,689	3,772
50300464. Lapp	0	0	0	0	0	0	0	0	0	0
50400- Wastewater - Arapuni	90,651	92,675	94,460	97,388	99,250	101,579	106,445	108,385	110,325	116,676
50400010. Depreciation	13,053	13,137	13,137	14,358	14,358	14,825	17,905	17,905	17,905	22,161
50400010004. Depreciation	0	0	0	0	0	0	0	0	0	0
50400109. Laboratory	3,200	3,280	3,354	3,424	3,501	3,578	3,651	3,731	3,811	3,898
50400109650. Laboratory Internal Water Services	500	513	524	535	547	559	571	583	596	609
50400110. Operations	35,000	35,875	36,680	37,450	38,290	39,130	39,935	40,810	41,685	42,630
50400110650. Operations Internal WM	20,000	20,500	20,960	21,400	21,880	22,360	22,820	23,320	23,820	24,360
50400111. Resource consents	2,500	2,563	2,620	2,675	2,735	2,795	2,853	2,915	2,978	3,045
50400303. Repairs & Mtce - Reticulation	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
50400303650. R & M Reticulation Internal WM	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
50400352. Power	1,000	1,025	1,048	1,070	1,094	1,118	1,141	1,166	1,191	1,218
50400458. Insurance	669	686	701	716	732	748	763	780	797	815
50400463. Rates - WRC	450	461	472	482	492	503	513	525	536	548
50400463625. Council Rates - SWDC	4,279	4,386	4,484	4,579	4,681	4,784	4,882	4,989	5,096	5,212
50400464. Lapp	0	0	0	0	0	0	0	0	0	0
92000- Wastewater Services	1,120,000	1,148,000	1,173,760	1,198,400	1,225,280	1,252,160	1,277,920	1,305,920	1,333,920	1,364,160
9200000267000. OH - Human Resources	13,946	15,080	15,904	16,795	16,976	17,473	17,942	18,506	19,005	19,601
9200000267001. OH to Health & Safety	47,656	50,056	51,732	53,482	53,849	54,832	55,765	56,854	57,834	58,999
9200000268000. OH - Information Services	99,470	133,609	151,409	173,332	157,800	157,597	157,097	164,839	165,696	169,212
92000006. Internal Vehicle Charge	0	0	0	0	0	0	0	0	0	0
92000010002. Depreciation	0	0	0	0	0	0	0	0	0	0
92000109001. Laboratory Materials	10,200	10,455	10,690	10,914	11,159	11,404	11,638	11,893	12,148	12,424
92000109005. Laboratory - Equipment Mtce	4,000	4,100	4,192	4,280	4,376	4,472	4,564	4,664	4,764	4,872
92000145. Wm J Costs	508,000	520,700	532,384	543,560	555,752	567,944	579,628	592,328	605,028	618,744
92000308. Miscellaneous	4,000	4,100	4,192	4,280	4,376	4,472	4,564	4,664	4,764	4,872
92000310. Mobil Equipment Card	1,200	1,230	1,258	1,284	1,313	1,342	1,369	1,399	1,429	1,462
92000311. Tools	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
92000312. Merchandise - Stock	2,500	2,562	2,620	2,675	2,735	2,795	2,852	2,915	2,977	3,045
92000400393. Vehicle expenses	5,000	5,125	5,240	5,350	5,470	5,590	5,705	5,830	5,955	6,090
92000405. Plant Cost - Job Cost	50,000	51,250	52,400	53,500	54,700	55,900	57,050	58,300	59,550	60,900
92000406. Plant Recovery - Job Cost	(40,000)	(41,000)	(41,920)	(42,800)	(43,760)	(44,720)	(45,640)	(46,640)	(47,640)	(48,720)
92000416. Training	15,000	15,375	15,720	16,050	16,410	16,770	17,115	17,490	17,865	18,270
92000419000. Salaries	107,194	109,338	111,524	113,755	116,030	118,350	120,717	123,132	125,594	128,106
92000421. Protective Clothing	5,700	5,843	5,974	6,099	6,236	6,373	6,504	6,646	6,789	6,943
92000445000. Wages - Job Cost	592,142	603,985	616,065	628,386	640,954	653,773	666,848	680,185	693,789	707,664
92000446. Wages Recovery - Job Cost	(485,000)	(497,125)	(508,280)	(518,950)	(530,590)	(542,230)	(553,385)	(565,510)	(577,635)	(590,730)
92000456. Loss On Sale - Stock	(3,000)	(3,075)	(3,144)	(3,210)	(3,282)	(3,354)	(3,423)	(3,498)	(3,573)	(3,654)
92000507605. Corporate Copier Charges	950	974	996	1,017	1,039	1,062	1,084	1,108	1,131	1,157
92000510. Telephone & Tolls	7,600	7,790	7,965	8,132	8,314	8,497	8,672	8,862	9,052	9,257
92000513. Equipment Maintenance	3,000	3,075	3,144	3,210	3,282	3,354	3,423	3,498	3,573	3,654
92000715. Overhead Recoveries	165,442	139,429	128,457	111,910	136,672	144,875	152,125	152,626	159,869	165,903

G2 CAPEX RENEWALS & IMPROVEMENT LTP PROGRAMMES – July 2021

Waste Water Capital Renewals by Detail – July 2021

Expenditure Type	Project ID	Project Names	Community	Total Cost	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Capital Renewals	314	Replacement generator	District Wide	**42,000**	42,000									
Capital Renewals	315	Replacement generator	District Wide	**36,500**		36,500								
Capital Renewals	316	Replacement generator	District Wide	**36,500**			36,500							
Capital Renewals	319	Tokoroa WWTP UV Lamp	District Wide	**400,000**	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Capital Renewals	327	Arapuni Wastewater equipment	Arapuni	**12,500**	2,500					10,000				
Capital Renewals	318	Tirau St - Putāruru Wastewater main	Putāruru	**165,000**		165,000								
Capital Renewals	320	Putāruru WWTP UV lamp	Putāruru	**80,000**	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Capital Renewals	325	Putāruru Wastewater Plant &	Putāruru	**705,000**	87,500	50,000	52,500	75,000	90,000	150,000	50,000	50,000	50,000	50,000
Capital Renewals	330	Putāruru Wastewater Main renewal	Putāruru	**708,000**				60,000	108,000	108,000	108,000	108,000	108,000	108,000
Capital Renewals	321	Tirau WWTP Membrane	Tirau	**225,000**	45,000		45,000		45,000		45,000		45,000	
Capital Renewals	324	Tirau WWTP - Inlet Screen Renewal	Tirau	**85,000**					85,000					
Capital Renewals	326	Tirau Wastewater Plant & Equipment	Tirau	**445,000**	100,000	55,000	25,000	55,000	25,000	65,000	30,000	30,000	30,000	30,000
Capital Renewals	322	Tokoroa WWTP Plant & Equipment	Tokoroa	**2,045,500**	115,000	135,000	315,000	170,500	140,000	510,000	180,000	180,000	150,000	150,000
Capital Renewals	323	Tokoroa WWTP - FAST filter media	Tokoroa	**650,000**			650,000							
Capital Renewals	329	Tokoroa Wastewater Main renewal	Tokoroa	**2,720,000**			115,000	200,000	215,000	320,000	430,000	480,000	480,000	480,000
Subtotal Capital Renewals - Districtwide				***515,000***	*82,000*	*76,500*	*76,500*	*40,000*	*40,000*	*40,000*	*40,000*	*40,000*	*40,000*	*40,000*
Subtotal Capital Renewals - Tokoroa				***5,415,500***	*115,000*	*135,000*	*1,080,000*	*370,500*	*355,000*	*830,000*	*610,000*	*660,000*	*630,000*	*630,000*
Subtotal Capital Renewals - Puataruru				***1,658,000***	*95,500*	*223,000*	*60,500*	*143,000*	*206,000*	*266,000*	*166,000*	*166,000*	*166,000*	*166,000*
Subtotal Capital Renewals - Tirau				***755,000***	*145,000*	*55,000*	*70,000*	*55,000*	*155,000*	*65,000*	*75,000*	*30,000*	*75,000*	*30,000*
Subtotal Capital Renewals - Arapuni				***12,500***	*2,500*	*0*	*0*	*0*	*0*	*10,000*	*0*	*0*	*0*	*0*
Total Capital Renewals				**8,356,000**	**440,000**	**489,500**	**1,287,000**	**608,500**	**756,000**	**1,211,000**	**891,000**	**896,000**	**911,000**	**866,000**

Waste Water Capital Improvements by Detail – July 2021

Expenditure Type	Project ID	Project Names	Community	Total Cost	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Capital Improvements Growth	334	Wastewater Development Contributions	District Wide	150,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Capital Improvements Growth	339	Buckland Street Pump Station Capacity Upgrade	Putaruru	386,372									386,372	
Capital Improvements LOS	312	Wastewater District Wide Health & Safety	District Wide	300,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Capital Improvements LOS	335	Putaruru WWTP Consnet Upgrades	Putaruru	6,755,000			275,000	3,240,000	3,240,000					
Capital Improvements LOS	338	Galway Crescent WWPS - Flood Protection Works	Putaruru	85,000					85,000					
Capital Improvements LOS	310	Tirau - Dept Street Pump Station - Satge 1	Tirau	1,025,000		100,000	925,000							
Capital Improvements LOS	308	SCADA Telemetry Upgrade - Funded by 3-Waters Reform	Tokoroa	219,000	219,000									
Capital Improvements LOS	309	De-Nitrification - Funded by 3-Waters Reform	Tokoroa	1,389,000	1,389,000									
Capital Improvements LOS	311	Tokoroa Wastewater Pump Stations	Tokoroa	1,500,000				250,000	250,000	250,000	250,000	250,000	250,000	
Capital Improvements LOS	317	Baird Road & Tasman Drive WWPS Seismic Upgrades	Tokoroa	59,000				35,000	24,000					
Capital Improvements LOS	328	Tokoroa Wastewater Plant - Digester Refurbishment	Tokoroa	1,940,000	1,070,000	870,000								
Capital Improvements LOS	333	Baird Road WWPS - Inlet Screen	Tokoroa	90,000	90,000									
Capital Improvements LOS	336	Tokoroa WWTP UV System Duplication	Tokoroa	250,000		250,000								
Capital Improvements LOS	337	Tokoroa WWTP Duplicate Drum Filter	Tokoroa	210,000			210,000							
Subtotal Capital Improvements - Districtwide				***450,000***	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*	*45,000*
Subtotal Capital Improvements - Tokoroa				***5,657,000***	*2,768,000*	*1,120,000*	*210,000*	*285,000*	*274,000*	*250,000*	*250,000*	*250,000*	*250,000*	*0*
Subtotal Capital Improvements - Puataruru				***7,226,372***	*0*	*0*	*275,000*	*3,240,000*	*3,325,000*	*0*	*0*	*0*	*386,372*	*0*
Subtotal Capital Improvements - Tirau				***1,025,000***	*0*	*100,000*	*925,000*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Subtotal Capital Improvements - Arapuni				***0***	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Subtotal Capital Improvements Growth				***536,372***	*15,000*	*15,000*	*15,000*	*15,000*	*15,000*	*15,000*	*15,000*	*15,000*	*401,372*	*15,000*
Subtotal Capital Improvements LOS				***13,822,000***	*2,798,000*	*1,250,000*	*1,440,000*	*3,555,000*	*3,629,000*	*280,000*	*280,000*	*280,000*	*280,000*	*30,000*
Total Capital Improvements				**14,358,372**	**2,813,000**	**1,265,000**	**1,455,000**	**3,570,000**	**3,644,000**	**295,000**	**295,000**	**295,000**	**681,372**	**45,000**

** Water Supply District Wide Health & Safety Upgrade project transferred to Water Supply AMP*

G3 THREE WATERS SCOPE – LTP 2021 SCOPE INCLUDING LTP AMENDMENTS AND NEW WORKS

Scope			Capex Spend By Year										OPEX		Opex Spend By Year								
	Project	Total CAPEX (unrisked)	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Consequential	Total OPEX (Unrisked)	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
NWI2	Baird Road Stormwater*	$ 2,704,354			$ 1,352,177	$ 1,352,177							2.0%					$ 54,087	$ 54,087	$ 54,087	$ 54,087	$ 54,087	$ 54,087
	- Inc. Baird Rd Channel Works																						
	- Inc. Baird Rd Culvert Upgrade																						
NWI2	Dreghorn Place Stormwater*	$ 1,217,260			$ 608,630	$ 608,630							2.0%					$ 24,345	$ 24,345	$ 24,345	$ 24,345	$ 24,345	$ 24,345
NWI2	St Andrews Drive Stormwater*	$ 1,048,044			$ 524,022	$ 524,022							2.0%					$ 20,961	$ 20,961	$ 20,961	$ 20,961	$ 20,961	$ 20,961
NWI2	Giles Street and Pelican Place Stormwater*	$ 7,547,578			$ 754,758	$ 754,758	$ 3,019,030	$ 3,019,030					2.0%							$ 150,952	$ 150,952	$ 150,952	$ 150,952
NWI2	Strathmore Park Stormwater	$ 3,327,868			$ 1,663,934	$ 1,663,934	$ -	$ -					2.0%					$ 66,557	$ 66,557	$ 66,557	$ 66,557	$ 66,557	$ 66,557
NWI2	Mareeba Road Intermodal Business Park (MRIPB) Stormwater and Water	$ 1,915,865			$ 957,933	$ 957,933	$ -	$ -					2.0%					$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317
NWI2	Putaruru Stormwater	$ 6,960,378			$ 3,491,689	$ 3,491,689	$ -	$ -					2.0%					$ 139,668	$ 139,668	$ 139,668	$ 139,668	$ 139,668	$ 139,668
AMNZ702	Putaruru Improvements - Arapuni Rd culvert	$ 164,000		$ 160,000									2.0%	$ 26,240		$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280	$ 3,280
AMNZ702	Putaruru Arapuni S'open channel& culvert improvements	$ 1,082,000					$ 541,000	$ 541,000					2.0%	$ 86,560		$ -	$ -	$ -		$ 21,640	$ 21,640	$ 21,640	$ 21,640
NWI2	Tirau Stormwater	$ 3,711,330			$ 1,855,665	$ 1,855,665	$ -	$ -					2.0%					$ 74,227	$ 74,227	$ 74,227	$ 74,227	$ 74,227	$ 74,227
NWI2	Mamaku Street Culvert Replacement	$ 105,000				$ 35,000	$ 35,000	$ 35,000					2.0%										
NWI2	Mamaku Street Culvert Replacement	$ 45,000				$ 15,000	$ 15,000	$ 15,000					2.0%										
LTP21	Treatment devices	$ 4,334,000					$ 722,333	$ 722,333	$ 722,333	$ 722,333	$ 722,333	$ 722,333	2.0%	$ -		$ -	$ -	$ -					
LTP21	Urban stormwater consent renewals	$ 102,000			$ 102,000								2.0%	$ 14,280		$ -	$ 2,040	$ 2,040	$ 2,040	$ 2,040	$ 2,040	$ 2,040	$ 2,040
LTP21	Buckland Street culvert replacement	$ 204,000				$ 204,000							2.0%	$ 24,480		$ -		$ 4,080	$ 4,080	$ 4,080	$ 4,080	$ 4,080	$ 4,080
LTP21	Philip Street improvements	$ 246,000								$ 246,000			2.0%	$ 14,760		$ -	$ -	$ -	$ -	$ -	$ 4,920	$ 4,920	$ 4,920
LTP21	SH 1 Countdown network improvements	$ 182,000						$ 182,000					2.0%	$ 18,200		$ -	$ -			$ 3,640	$ 3,640	$ 3,640	$ 3,640
LTP21	Scott Glen to Golf Street - piping open drain	$ 930,000				$ 465,000	$ 465,000						2.0%	$ 92,000		$ -	$ -			$ 18,600	$ 18,600	$ 18,600	$ 18,600
LTP21	Improvements - SH1/Manly Martin Drive	$ 103,000		$ 34,333						$ 34,333	$ 34,333		2.0%	$ 4,120								$ 2,060	$ 2,060
LTP21	Minor new works	$ 122,000		$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	2.0%	$ -									
LTP21	Generic upgrades	$ 314,000		$ 104,667		$ 104,667	$ 104,667						2.0%	$ 31,400					$ 6,280	$ 6,280	$ 6,280	$ 6,280	$ 6,280
LTP21	Minor new works	$ 122,000		$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	$ 13,556	2.0%	$ -									
LTP21	Generic upgrades	$ 321,000		$ 107,000			$ 107,000	$ 107,000					2.0%	$ 25,680					$ 5,420	$ 5,420	$ 5,420	$ 5,420	$ 5,420
LTP21	Rehabilitation	$ 640,000								$ 213,333	$ 213,333	$ 213,333	2.0%	$ 12,800		$ -	$ -	$ -	$ -				$ 12,800
PCLTP21	Stormwater Tirau - Minor New Works	$ 55,000	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	2.0%	$ -									
PCLTP21	Stormwater Arapuni - Minor New Works	$ 55,000	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	$ 5,500	2.0%	$ -									
NWI2	Tokoroa Wastewater Growth	$ 2,607,382	$ -				$ 1,303,691	$ 1,303,691					1.0%	$ 104,295						$ 26,074	$ 26,074	$ 26,074	$ 26,074
NWI2	District wide Water and Wastewater Telemetry and SCADA upgrades	$ 1,106,250			$ 553,125	$ 553,125							10.0%	$ 553,750				$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625
NWI2	Tirau Wastewater	$ 3,973,200			$ -	$ -	$ 1,986,600	$ 1,986,600					1.0%	$ 198,928						$ 39,732	$ 39,732	$ 39,732	$ 39,732
LTP21	Wastewater Development Contributions	$ 150,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	1.0%	$ -									
LTP21	Buckland Street Pump Station Capacity Upgrade	$ 386,370									$ 386,370		1.0%	$ 3,864									$ 3,864
LTP21	Wastewater District Wide Health & Safety	$ 300,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	1.0%	$ -									
LTP21	Putaruru WWTP Consent Upgrade	$ 6,748,000			$ 275,000	$ 3,240,000	$ 3,240,000						1.0%	$ 337,740					$ 67,550	$ 67,550	$ 67,550	$ 67,550	$ 67,550
LTP21	Gateway Crescent WWPS - Flood Protection Work	$ 86,000					$ 86,000						1.0%	$ 4,300					$ 860	$ 860	$ 860	$ 860	$ 860
LTP21	Tirau - Depot Bit Pumpstation - Stage 1	$ 1,026,000		$ 100,000	$ 926,000								1.0%	$ 71,730			$ 10,260	$ 10,260	$ 10,260	$ 10,260	$ 10,260	$ 10,260	$ 10,260
LTP21	SCADA Telemetry Upgrade - Funded by 3 Waters Reform	$ 219,000	$ 219,000										1.0%	$ 19,710	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190	$ 2,190
LTP21	Demolition - Funder by 3 Waters Reform	$ 1,389,000	$ 1,389,000										1.0%	$ 126,010	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890	$ 13,890
LTP21	Tokoroa Wastewater Pump Station	$ 1,500,000				$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000		1.0%	$ 15,000									$ 15,000
LTP21	Baird Rd & Freeman Drive WWPS Seismic Upgrade	$ 59,000				$ 35,000	$ 24,000						1.0%	$ 2,950					$ 590	$ 590	$ 590	$ 590	$ 590
LTP21	Tokoroa Wastewater Plant - Digester Refurbishment	$ 1,940,000	$ 1,070,000	$ 870,000									1.0%	$ 155,200		$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400	$ 19,400
LTP21	Baird Rd WWPS - Inlet Screen	$ 90,000	$ 90,000										1.0%	$ 8,100	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900	$ 900
LTP21	Tokoroa WW TP UV System Duplication	$ 280,000		$ 280,000									1.0%	$ 22,000		$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800	$ 2,800
LTP21	Tokoroa WW TP Duplicate Drum Filter	$ 210,000			$ 210,000								1.0%	$ 14,700			$ 2,100	$ 2,100	$ 2,100	$ 2,100	$ 2,100	$ 2,100	$ 2,100
LTP21	Replacement Generator	$ 42,000	$ 42,000										1.0%	$ 3,780	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420
LTP21	Replacement Generator	$ 36,500		$ 36,500									1.0%	$ 2,920		$ 365	$ 365	$ 365	$ 365	$ 365	$ 365	$ 365	$ 365
LTP21	Replacement Generator	$ 36,500			$ 36,500								1.0%	$ 2,555			$ 365	$ 365	$ 365	$ 365	$ 365	$ 365	$ 365
LTP21	Tokoroa WW TP UV Lamp	$ 400,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	1.0%	$ -									
LTP21	Arapuni Wastewater Equipment	$ 12,500	$ 2,500					$ 10,000					1.0%	$ 500						$ 125	$ 125	$ 125	$ 125
LTP21	Tirau St - Putaruru Wastewater Main	$ 165,000		$ 165,000									1.0%	$ 13,200		$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650	$ 1,650
LTP21	Putaruru WWTP UV Lamp	$ 80,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000	1.0%	$ -									
LTP21	Putaruru Wastewater Plant S	$ 705,000	$ 87,500	$ 50,000	$ 52,500	$ 75,000	$ 90,000	$ 150,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	1.0%	$ -									
LTP21	Putaruru Wastewater Main Renewal	$ 708,000				$ 60,000	$ 108,000	$ 108,000	$ 108,000	$ 108,000	$ 108,000	$ 108,000	1.0%	$ -									
LTP21	Tirau WW TP Membrane	$ 225,000	$ 45,000		$ 45,000		$ 45,000		$ 45,000		$ 45,000		1.0%	$ 2,250									$ 2,250
LTP21	Tirau WW TP - Inlet Screen Renewal	$ 88,000					$ 88,000						1.0%	$ 4,280					$ 880	$ 880	$ 880	$ 880	$ 880
LTP21	Tirau Wastewater Plant & Equipment	$ 445,000	$ 100,000	$ 55,000	$ 35,000	$ 55,000	$ 28,000	$ 55,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	1.0%	$ -									
LTP21	Tokoroa WW TP Plant & Equipment	$ 2,045,500	$ 115,000	$ 105,000	$ 315,000	$ 170,500	$ 140,000	$ 510,000	$ 180,000	$ 180,000	$ 150,000	$ 150,000	1.0%	$ -									
LTP21	Tokoroa WW TP - FAST Filter Media	$ 680,000			$ 680,000								1.0%	$ 45,900			$ 6,800	$ 6,800	$ 6,800	$ 6,800	$ 6,800	$ 6,800	$ 6,800
LTP21	Tokoroa Wastewater Main Renewal	$ 2,730,000			$ 115,000	$ 200,000	$ 215,000	$ 320,000	$ 430,000	$ 480,000	$ 480,000	$ 480,000	1.0%	$ -									
NWI2	Arapuni Road WWPS	$ 350,000			$ 350,000								1.0%	$ 24,500			$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500	$ 3,500
NWI2	Tokoroa Ferguson St Wastewater Main Renewal	$ 300,000			$ 300,000								1.0%	$ 21,000			$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000
NWI2	Tokoroa Water Supply Growth	$ 7,220,918					$ 3,610,457	$ 3,610,457					0.5%								$ 36,105	$ 36,105	$ 36,105
NWI2	Hon-ou-henua Water Supply	$ 301,000			$ 301,000	$ -	$ -	$ -					0.5%				$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505	$ 1,505
NWI2	Mareeba Road Intermodal Business Park (MRIPB) Stormwater and Water	$ 1,915,865			$ 957,933	$ 957,933	$ -	$ -					2.0%					$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317	$ 38,317
NWI2	Tirau Water Supply	$ 7,257,215			$ -	$ -	$ 3,628,608	$ 3,628,608					0.5%								$ 36,286	$ 36,286	$ 36,286
NWI2	District wide Water and Wastewater Telemetry and SCADA upgrades	$ 1,106,250			$ 553,125	$ 553,125	$ -	$ -					10.0%					$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625	$ 110,625
LTP21	Watermain Renewal Programme - Tokoroa	$ 6,000,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	0.5%	$ -									
LTP21	Watermain Renewal Programme - Arapuni	$ 360,000		$ 120,000			$ 120,000			$ 120,000			0.5%	$ 3,600							$ 1,800	$ 1,800	
LTP21	Watermain Renewal Programme - Putaruru	$ 1,495,000	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	$ 149,500	0.5%	$ -									
LTP21	Watermain Renewal Programme - Tirau	$ 420,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	$ 42,000	0.5%	$ -									
LTP21	Watermain Renewal Programme - Lichfield	$ 50,000				$ 25,000					$ 25,000		0.5%	$ 250									$ 250
LTP21	Arapuni Water Supply Bore Replacement	$ 195,000	$ 195,000										0.5%	$ 8,775	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975	$ 975
LTP21	Tirau Water Supply Plant & Equipment Replacement	$ 247,000	$ 15,000	$ 40,000	$ 15,000	$ 57,000	$ 45,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	0.5%	$ -									
LTP21	Tokoroa Water Supply Plant & Equipment Replacement	$ 335,000	$ 25,000		$ 15,000	$ 15,000	$ 75,000	$ 50,000	$ 85,000	$ 20,000	$ 20,000	$ 20,000	0.5%	$ -									
LTP21	Tokoroa Water Supply Bilsh St Headworks Rising Main Replacement	$ 110,000		$ 110,000									0.5%	$ 4,400		$ 550	$ 550	$ 550	$ 550	$ 550	$ 550	$ 550	$ 550
LTP21	Arapuni Water Supply Plant & Equipment Replacement	$ 79,000	$ 8,000	$ 10,000	$ 5,000	$ 6,000	$ 7,000	$ 25,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	0.5%	$ -									
LTP21	Water Treatment Plant Telemetry Infrastructure Server Replacement (P1)	$ 54,000			$ 27,000					$ 27,000			0.5%	$ 540								$ 270	$ 270
LTP21	Tirau Water Supply Resource Consent Renewal	$ 30,000	$ 30,000										0.5%	$ 1,350	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150
LTP21	Arapuni Street Watermain Upgrade	$ 694,297										$ 694,297	0.5%	$ 3,471									$ 3,471
LTP21	Reservoir Street Water Main Upgrade	$ 1,757,568						$ 1,757,568					0.5%	$ 43,939					$ 8,788	$ 8,788	$ 8,788	$ 8,788	$ 8,788
LTP21	Bridson Street Watermain Upgrade	$ 803,603						$ 803,603					0.5%	$ 20,090					$ 4,018	$ 4,018	$ 4,018	$ 4,018	$ 4,018
LTP21	Glenshee Booster Pump	$ 799,806								$ 799,806			0.5%	$ 7,998									$ 3,999
LTP21	Seismic Assessments Water Supply Reservoir	$ 240,000				$ 120,000	$ 120,000						0.5%	$ 6,000					$ 1,200	$ 1,200	$ 1,200	$ 1,200	$ 1,200
LTP21	Glenshee Water Supply Reservoir Repairs	$ 40,000	$ 40,000										0.5%	$ 1,800	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200	$ 200
LTP21	Water Supply Putaruru - Capital Component of Maintenance	$ 150,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	0.5%	$ -									
LTP21	Water Supply Tirau - Capital Component of Maintenance	$ 120,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000	0.5%	$ -									
LTP21	Water Supply Tokoroa - Capital Component of Maintenance	$ 180,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000	0.5%	$ -									
LTP21	Putaruru Water Supply - Reticulation Minor New Works	$ 100,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	0.5%	$ -									
LTP21	Tokoroa Water Supply - Manfred Street Watermain Installation	$ 55,000		$ 55,000									0.5%	$ 2,200		$ 275	$ 275	$ 275	$ 275	$ 275	$ 275	$ 275	$ 275
LTP21	Putaruru Water Supply - pH Correction Plant	$ 55,000				$ 55,000							0.5%	$ 1,650				$ 275	$ 275	$ 275	$ 275	$ 275	$ 275
LTP21	Tirau Water Supply Reticulation Minor New Works	$ 100,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	0.5%	$ -									
LTP21	Bilsh Street Filtebn	$ 378,000				$ 378,000							0.5%	$ 11,340				$ 1,890	$ 1,890	$ 1,890	$ 1,890	$ 1,890	$ 1,890
LTP21	Tirau Water Supply Storage	$ 2,270,000			$ 220,000	$ 2,050,000							0.5%	$ 68,100				$ 11,350	$ 11,350	$ 11,350	$ 11,350	$ 11,350	$ 11,350
LTP21	Tirau Water Supply Reticulation Minor New Works	$ 1,100,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	$ 110,000	0.5%	$ -									
LTP21	Tokoro Water Supply	$ 2,050,000				$ 50,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000			0.5%	$ 20,500							$ 10,250	$ 10,250	
LTP21	Infrastructure Unit - Technology Upgrade New Mobile Devices (Interna	$ 15,000	$ 15,000										0.5%	$ 675	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75	$ 75
LTP21	Water District Wide Health & Safety Improvements	$ 300,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	0.5%	$ -									
		$ 106,975,399	Total CAPEX									$ 106,972,399			Total OPEX								$ 290,010

APPENDIX H CRITICAL ASSET MAPS

H1 TOKOROA CRITICAL ASSET MAP

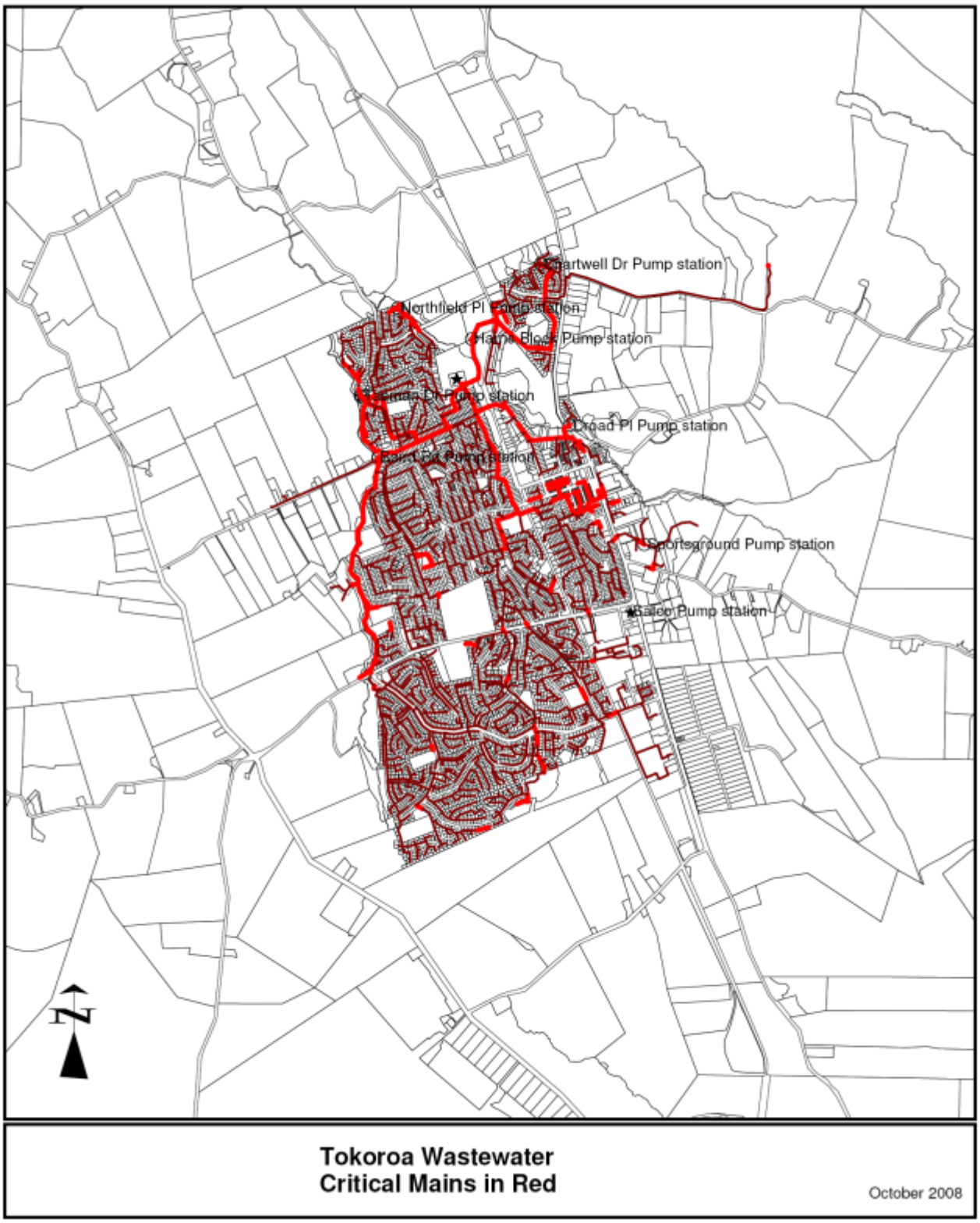


Figure I0.12 Tokoroa Critical Assets

H2 PUTĀRURU CRITICAL ASSET MAP

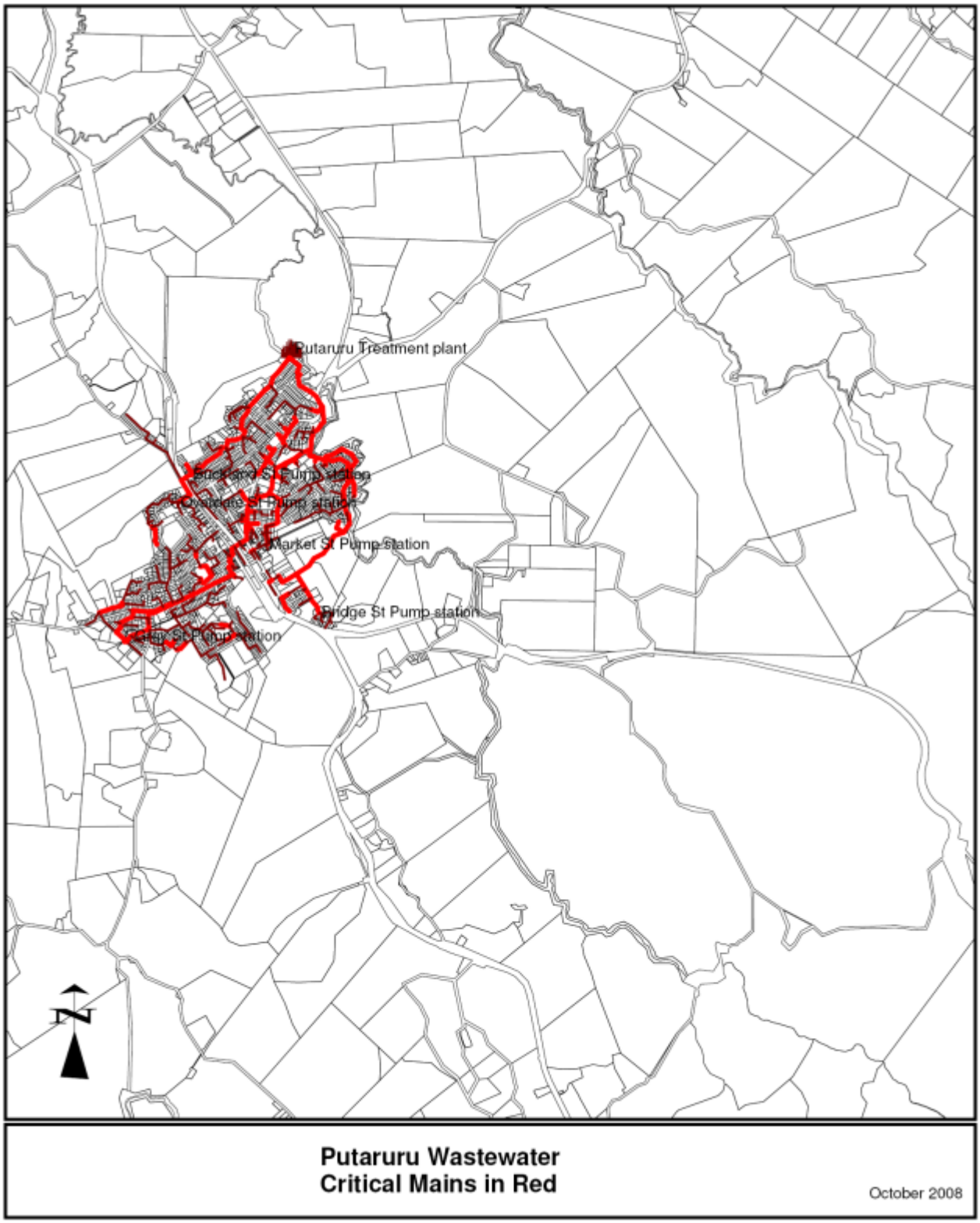


Figure I0.13 Putāruru Critical Assets

H3 TĪRAU CRITICAL ASSET MAP

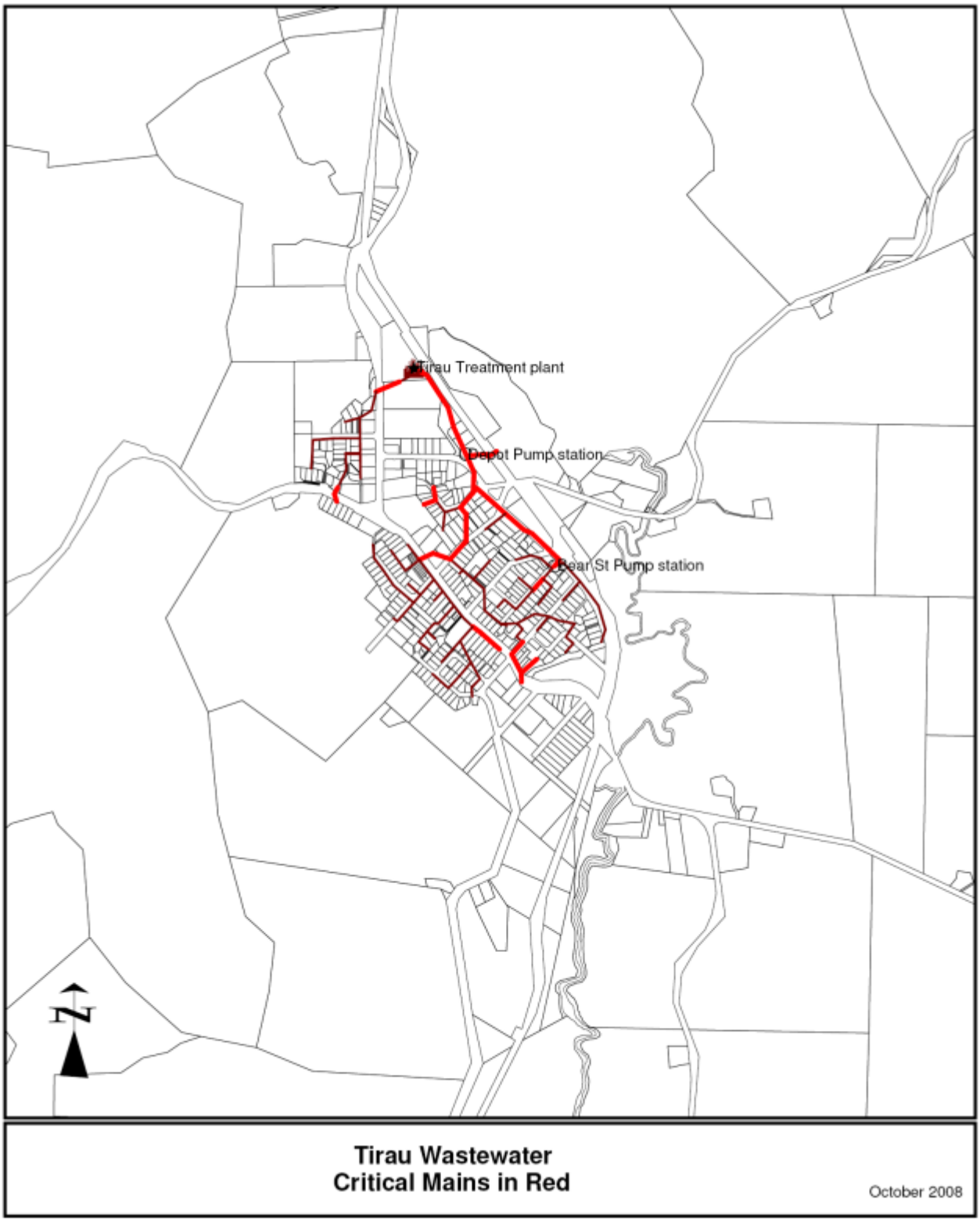


Figure I0.14 Tirau Critical Assets

H4 ARAPUNI CRITICAL ASSET MAP

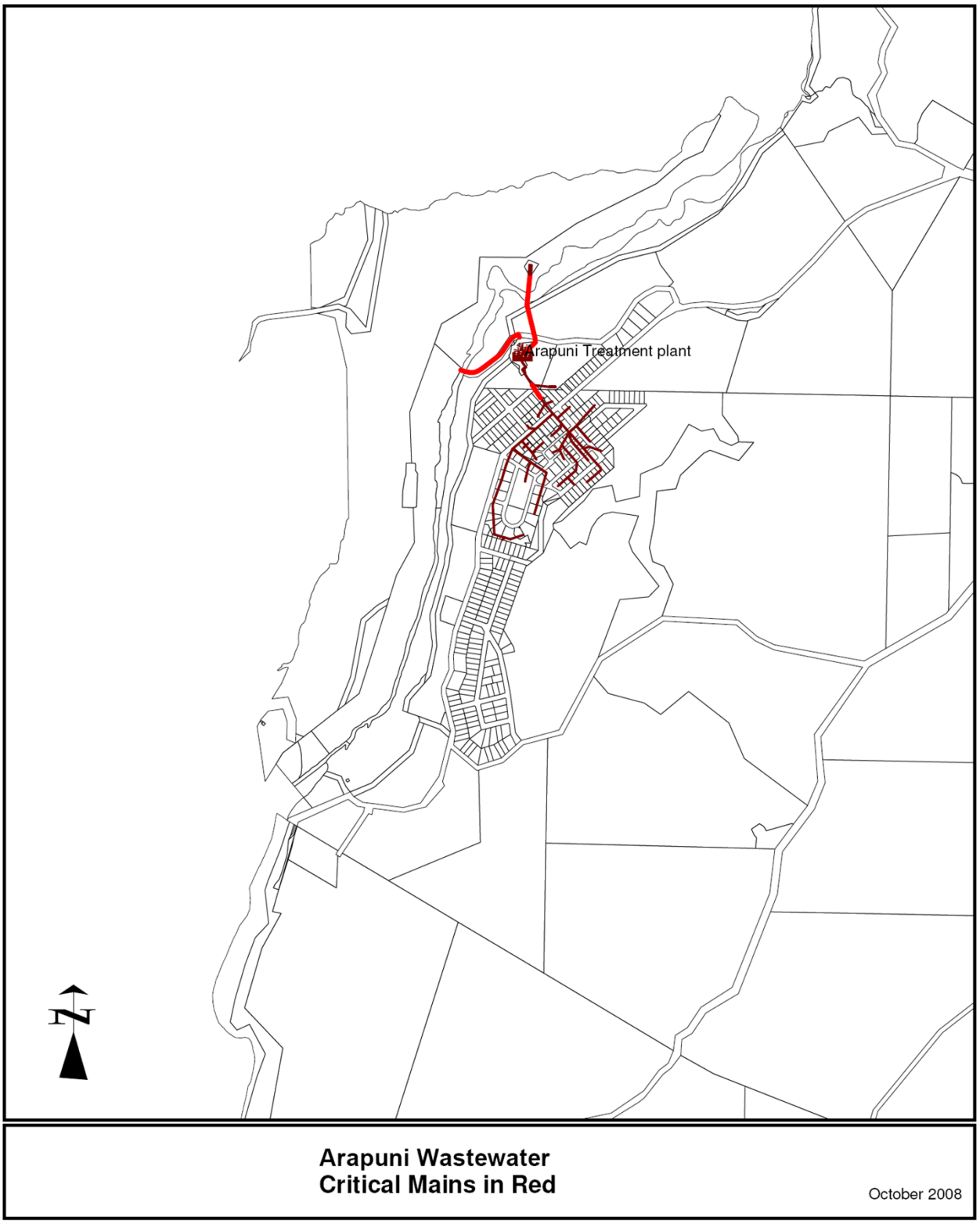


Figure I0.15 Arapuni Critical Assets